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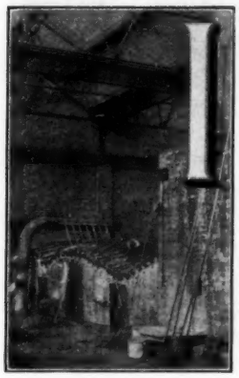
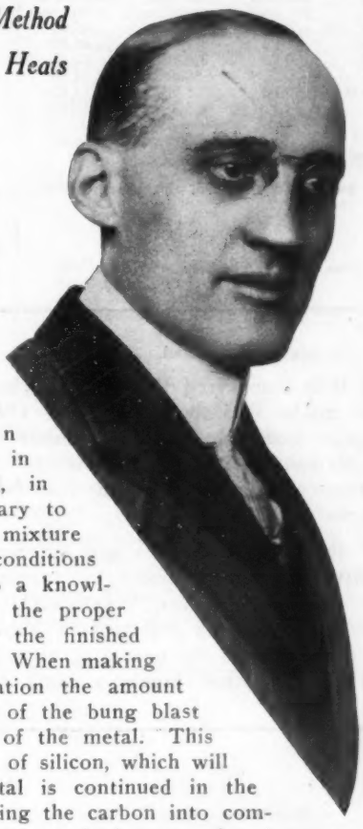
Calculating Mixtures for Malleable Cast Iron--I

A Rapid and Easy Method for Figuring the Heats

How the Problem is Solved by Use of Base Numbers

By Harrold Hemenway





IN calculating mixtures for malleable cast iron, a great many adverse conditions arise, owing to the fact that no two furnaces work alike. For this reason it is impossible to run the same mixture in all furnaces and, in fact, it is necessary to slightly vary the mixture in each furnace from time to time as conditions demand. However, it resolves itself into a knowledge of these conditions as to what is the proper mixture to be charged, so as to keep the finished product within certain well defined limits. When making a mixture, one must take into consideration the amount of blast pressure, together with the size of the bung blast pipes, which admit the air over the top of the metal. This has a controlling influence on the amount of silicon, which will be burned out during the time the metal is continued in the furnace to allow melting down and to bring the carbon into complete combination. The size of the heat required must also be taken into consideration, as in larger heats, the number of square inches of metal on the top exposed to the blast, is not increased in proportion to the depth of the metal. For this reason it is impossible to safely advise the amount of silicon a mixture should contain when charged, which at the time of pouring would be suitable for a certain class of work. This is a local condition which must be determined by the one calculating the mixture. The operator of the furnace should so understand conditions that he is not compelled to tap the heats at a certain time after skimming, but should know by the appearance of the metal at the time of skimming, how soon a test must be taken to see whether the carbon is completely combined. By cooling a test piece which will show the condition of the carbon, together with the appearance of the metal in the test ladle at the time of testing, will prove whether the original calculation was correct, or whether it is necessary to increase or decrease the amount of silicon required in the next heat, so as to have the carbon completely combined, when the metal is sufficiently heated, to run the class of work being made at that particular furnace. Taking for granted that the pig iron to be used is either charcoal or coke, purchased within the strict limits of the malleable Bessemer specifications, the metalloids, sulphur, phosphorus and manganese, will not be considered, as under ordinary furnace conditions these will be in the correct proportions. We, therefore, will consider the influence of silicon, which, of all the metalloids contained in pig iron, is probably the one upon which the greatest dependence is placed. It is conceded that silicon promotes the separation of graphitic carbon and in the malleable casting, carbon is one of the most important metalloids. In calculating a mixture, it is not necessary to figure the carbon contents, for when the other elements are within the proper limits, the percentage of silicon should indicate the proportion of combined and graphitic carbons. For this reason it is useless to specify any carbon or form of carbon in the pig iron for malleable, for the carbon point below which it is impossible to anneal is well defined and never is reached even by the amount of steel scrap it is possible to add satisfactorily to the mixture. While the presence of silicon is a necessity in the melting furnace, for if not present in sufficient quantity, the iron would burn and would be honey-combed when poured, still an excess of silicon is a hindrance in the annealing process. For the average malleable casting, the silicon in the hard iron should be between 0.60 per cent and 0.75 per cent; 0.65 per cent would be a fair average. In making a malleable mixture, the first factor to be considered is the amount of sprues to be used, together with the amounts of malleable and steel scrap. Let us consider the sprue graded as No. 5 iron, having the silicon at 0.60 per cent as a constant. This will work out to the best advantage even though the silicon in some heats will analyze 0.75 per cent or higher. The total percentage of carbon in the sprue is much lower than the total percentage of carbon in the pig iron, and by figuring this at a lower percentage, some allowance is made for this reduction in carbon. In calculating malleable mixtures using the sprue graded at a No. 5 iron, it will be easy to make a mixture using the pig iron graded as Nos. 1, 2, 3 and 4, having the approximate relative pro-

portion as nearly as possible to the sprue figured at 0.60 per cent silicon, and used as a No. 5 iron. The method of figuring the mixture is indicated in Table I. In calculating a mixture by the method outlined in Table I, the different amounts used are always figured in even hundred pounds. For this reason it is not necessary to consider the two ciphers in figuring a mixture. Therefore, the two ciphers have not been taken into consideration in determining the silicon contents of this heat. The mixture shown is for a nine-ton heat and will be figured at 180 instead of 18,000 pounds.

Table I

Method of Calculating a Malleable Mixture.

Brands of pig iron:		Silicon, per cent.	Amount, pounds.	Silicon in mixture.
Federal, No. 1		1.50	3,000 =	45.00
Iroquois, No. 2		1.20	3,500 =	42.00
Nellie, No. 3		0.90	3,600 =	32.40
Malleable scrap*	44 per cent. No. 5	....	800 =	4.80
Steel scrap*		0.60	600 =	3.60
Sprue*		....	6,500 =	39.00
			18,000 =	166.80

166.80 ÷ 180 = 0.926 per cent of silicon the mixture contains.
The grade at which the heat is figured is 3.35.
The grade, 3.35 × 180, the size of the heat in pounds, equals 603, the base number.
603 — 597 = +6
30 No. 1 + 36 No. 3 = 66.
101 sprues and scrap — 66 = 35 No. 2.

*These three amounts constitute the No. 5 iron in the mixture.

The Base Number

The grade at which the heat is to be figured must be determined first, and in this case is 3.35. Multiplying the grade 3.35 by the size of the heat in pounds, 180, equals 603, the base number from which to calculate the mixture, and the different amounts of pig iron and sprues used when multiplied by their grade numbers and added will equal this base number.

Calculating the Grade

In estimating the grade, I first discovered that by using the sprue graded as No. 5 iron and the pig iron graded as No. 2 iron, it was possible to obtain a base number and make a mixture containing all No. 2 pig iron and sprue. However, this was not always practical, as it would not always give the desired silicon contents, and it was necessary to use other grades of pig iron, which were indicated as Nos. 1 and 3. The different amounts of iron and sprues used, when multiplied by their grade numbers and added, give a base number from which to calculate the mixture. By dividing this base number by the size of the heat, gives a number which is termed the grade. Referring to Table I, using the amounts and pig iron grades indicated, the base and grade numbers are ascertained as follows:

Pig iron grade.	Pounds.	
No. 1	3,000 × 1 =	3,000
No. 2	3,500 × 2 =	7,000
No. 3	3,600 × 3 =	10,800
No. 5	7,900 × 5 =	39,500
	18,000	60,300

Pointing off two ciphers, 603 equals the base number and 603 divided by 180 equals 3.35, the grade at which the mixture is figured.

I then discovered that by changing the grade 0.05 points, would give enough change in the silicon contents to warrant changing the mixture to obtain different results in the furnaces.

Since enough changes and different mixtures could be made by varying the grade 0.05 points, I selected the grade numbers, as indicated in Table V, and arranged the heat card accordingly. Any other numbers could be selected for the grade and advanced enough points to make a decided change in the mixture. In changing a heat in daily practice, it is not always possible to make the change at an exact grade without changing two or three grades of iron, while by changing one grade of iron and the sprue will accomplish the desired results. This, for example, may make the grade, 3.34 or 3.36. The heat card which I use in daily practice has the base numbers figured for various size heats, commencing with a grade of 2.75 and advancing by 0.05 to 4.00.

Determining Pig Iron

Taking the percentage sprue required, Table I, and subtracting this amount in pounds from the size of the heat in pounds the remainder indicates the amount of pig iron to be used. If all of the pig iron used was to be graded as No. 2 iron and using the sprue as No. 5 iron, a base number for a nine-ton heat using 44 per cent sprue, would be determined as follows:

9-ton heat	180
44 per cent sprue, No. 5 iron.	—79 × 5 = 395
Pig iron, No. 2 iron	101 × 2 = 202
	180 = 597

Calculating the Mixture

In calculating a nine-ton heat having a grade of 3.35 the base number is 603 and the base number using 44 per cent sprue is 597. Subtracting 597 from 603 leaves a remainder of +6. For this reason it is necessary to use 600 pounds more of No. 3 iron than No. 1 iron to obtain a grade of 3.35, making the amounts of iron used when multiplied by their grade numbers and added equal 603. Using 3,000 pounds of No. 1 iron added to +6 equals 3,600 pounds of No. 3 iron, and these added and the result subtracted from 10,100 pounds equals 3,500 pounds of the No. 2 iron required. The calculation is proved as follows:

No. 1 Iron	30 × 1 = 30
No. 2 Iron	35 × 2 = 70
No. 3 Iron	36 × 3 = 108
Sprue No. 5 Iron	79 × 5 = 395
	180 = 603

the base number from which the calculation is made.

Since the amounts of the different

Table II

Brands of pig iron.	Silicon, per cent.	Amount, pounds.	Silicon in mixture.
Federal, No. 1	1.50	30 =	45.00
Iroquois, No. 2	1.20	35 =	42.00
Nellie, No. 3	0.90	36 =	32.40
Sprue, No. 5, 44 per cent	0.60	79 =	47.40
		180 =	166.80

166.80 divided by 180 = 0.926 per cent of silicon the mixture contains.
The grade number is 3.35 and the base is 603.

603
101 597
66
—— +6
35 No. 2. 30 No. 1.
36 No. 3.
66

Malleable scrap, 800 pounds.
Steel scrap, 600 pounds.

irons used when multiplied by the grade numbers and added equals 603 the grade is 3.35.

In calculating heats by this method the amounts of malleable and steel scrap used are deducted from the amount of sprue used, and for this reason the mixture is written as indicated in Table II.

Since the amounts of malleable and steel scrap used are deducted from the total amount of sprue used, the grade of the heat is raised or lowered as the amounts are increased or decreased. Thus by adding 100 pounds of steel scrap it is necessary to reduce the grade five points, and when leaving out 100 pounds, it is necessary to increase the grade five points. Malleable scrap does not have the same effect as steel scrap, and it is not necessary to change the grade unless the amounts used are increased or decreased at least 200 to 300 pounds.

To make up the same size heat having the same grade, but using 46 per cent sprue, the calculation is made as shown in Table III.

A Nine-Ton Heat

In calculating a nine-ton heat having a grade of 3.35, the base number is 603 and the base number using 46 per cent sprue is 609. Subtracting 609 from 603 gives a remainder of —6. For this reason it is necessary to use 600 pounds more of No. 1 iron than the No. 3 iron to obtain a grade of 3.35, making the amounts of iron used, when multiplied by their grade numbers and added equal 603. Using 3,000 pounds of No. 3 iron added to —6 equals 3,600 pounds of the No. 1 iron, and these added and the result subtracted from 9,700 pounds equals 3,100 pounds of the No. 2 iron required. The calculation is proved as follows:

No. 1 Iron.....	36 × 1 = 36
No. 2 Iron.....	31 × 2 = 62
No. 3 Iron.....	30 × 3 = 90
Sprue No. 5 Iron.....	83 × 5 = 415
	180 = 603

the base number from which the calculation is made.

Table III

Calculating a Mixture With 46 Per Cent Sprue.

9-ton heat		180
46 per cent sprue, No. 5 iron		—83 × 5 = 415
Pig iron, No. 2 iron		97 × 2 = 194
		180 = 609

Brands of pig iron.	Silicon, per cent.	Amount, pounds.	Silicon in mixture.
Federal, No. 1	1.50	36 =	54.00
Iroquois, No. 2	1.20	31 =	37.20
Nellie, No. 3	0.90	30 =	27.00
Sprue, No. 5, 46 per cent	0.60	83 =	49.80
		180 =	168.00

168.00 divided by 180 = 0.933 per cent of silicon the mixture contains.
The grade number is 3.35.

97	603	
66	609	
—	—6	
31 No. 2.	30 No. 3.	
	36 No. 1.	
	66	

Malleable scrap, 800 pounds.
Steel scrap, 600 pounds.

Let us now consider the proper way to calculate heats for one furnace running three heats on a cast day, the first heat to be charged into a hot furnace. The calculation would be made as shown in Table IV.

Table IV shows the method of calculating three heats to be run in one furnace and the amounts of malleable and steel scrap must be weighed for each heat and deducted from the amount of sprue used. The second and third heats were originally made out, having the grade five points higher than the first heat. This is a general rule, as the furnace is considerably hotter and would, therefore, handle a higher mixture. Supposing that upon tapping the first heat, the iron was a little dull and not entirely satisfactory for the class of work being made. It is then not desirable to have a higher mixture for the second heat, but a heat must be charged having the same silicon contents. Reducing the grade to 3.35, the base number for an 8½-ton heat having this grade is 570. Subtracting 570 from 578 (the base number used in calculating the heat) leaves a remainder of —8 points. Wanting to run the same size heat it is necessary to change the amounts of pig iron and sprue used to equal —8 points. The change is made as follows:

Take out sprue	No. 5 iron	—2 x 5 = —10
Bring in	No. 1 iron	+2 x 1 = + 2
		0 = —8

By taking out 200 pounds of sprue, silicon 0.60 per cent, and bringing in 200 pounds of No. 1 iron, silicon 1.50 per cent, the size of the heat has not been changed, but the grade has been reduced five points, which has increased the silicon contents to 0.928 per cent.

The Third Heat

Suppose that this mixture proved a little too soft and it was necessary to continue the metal in the furnace a little longer in order to completely combine the carbon. It is then necessary to have a higher mixture for the third heat, and a nine-ton heat is required which is 1,000 pounds larger than the heat which has already been weighed. Increasing the grade to 3.50, the base number for a 9-ton heat having this grade is 630. Subtracting 578 (the base number used in calculating the heat) from 630 gives a remainder of +52 points. For this

Table IV

Calculating Heats For One Furnace Running Three Heats on a Cast Day.

Brands of pig iron:	Silicon. per cent.	Silicon, 0.926 per cent.	Silicon. 0.928 per cent.	Silicon. 0.898 per cent.
Federal, No. 1	1.50	30	30 + 2 = 32	30
Iroquois, No. 2	1.20	35	28	28
Nellie, No. 3	0.90	36	34	34 — 1 = 33
Sprue, No. 5, 44, 45 and 49 per cent	0.60	79	78 — 2 = 76	78 + 11 = 89
		180	170 — 170	170 — 180
		3.35	3.40 — 3.35	3.40 — 3.50
		603	578 578	578 630
	101	597 92	574 570	574 578
	66	— 64	— —	— —
	35*	+6 —	+4 —8	+4 +52
		30‡ 28*	30‡	30‡
		36**	34** 92	34**
		—	— 64	—
		66	64 —	64
			28*	

Malleable scrap, 800 pounds.
Steel scrap, 600 pounds.

‡No. 1. *No. 2. **No. 3.

reason 1,000 pounds must be added to equal +52 points.

The change is made as follows:

Bring in sprue No. 5 iron..	$+11 \times 5 = +55$
Take out No. 3 iron.....	$-1 \times 3 = -3$
	$10 = +52$

By bringing in 1,100 pounds of sprue, silicon 0.60 per cent, and taking out 100 pounds of No. 3 iron, silicon 0.90 per cent, the heat has been increased to nine tons and the grade has been increased 10 points, which has reduced the silicon contents to 0.898 per cent.

Record Kept

To accomplish this last change it has been necessary to take out 100 pounds of pig iron in order to have the mixture calculated at the exact grade. In every-day practice this would not be done, as there is only 30 points difference between the No. 3 iron and the sprue, so that the easiest and simplest way to make this change would have been to bring in 1,000 pounds of sprue. This would have increased the heat to the required size and also reduced the silicon contents. The changes in the silicon contents for each heat is noted in Table IV, and each day's heats are copied onto a card or into a book for permanent record. This record should show the different irons used, together with the silicon contents and the grade, which will form a basis for future calculations.

Determining the Grade

In selecting the pig iron for this mixture we determined to use the iron having 1.50 per cent silicon for the No. 1 iron, and as the sprue is figured as No. 5 iron having 0.60 per cent silicon, the No. 2 and No. 3 irons are determined as follows:

	Per cent silicon.
No. 1 iron	1.50
Sprue, No. 5 iron.....	—0.60
	$90 \div 3 = 30$.

the number of points each grade must increase to be in exact proportion to each other and to the sprue figured as No. 5 iron having 0.60 per cent

	Per cent, silicon.
Sprue, No. 5 iron.....	0.60
	+30
No. 3 iron.....	0.90
	+30
No. 2 iron.....	1.20
	+30
No. 1 iron.....	1.50

This shows that the different grades of irons used in this mixture are in exact proportion to each other.

Let us suppose that it is necessary to change this mixture so as to make a line of lighter castings, for which reason the silicon contents in the mixture must be increased.

In order to use the surplus of sprue to advantage it is necessary to use a much softer grade of pig iron for the No. 1 iron, so as not to reduce the amount of sprue used, but rather be in position to increase this. Upon looking over the stock of pig iron we find a car of iron having silicon, 1.95 per cent. The sprue will be figured as having 0.60 per cent silicon, and any difference (caused by the sprue having more than 0.60 per cent silicon) will be overcome by changing the grade of the heats. The different grades of pig iron are determined as follows:

	Per cent, silicon.
No. 1 iron	1.95
Sprue, No. 5 iron.....	—0.60
	$1.35 \div 3 = 45$,

the number of points each grade must increase to be in exact proportion to each other and the sprue figured as No. 5 iron having 0.60 per cent silicon.

	Per cent, silicon.
Sprue, No. 5 iron.....	0.60
	+45
No. 3 iron.....	1.05
	+45
No. 2 iron.....	1.50
	+45
No. 1 iron.....	1.95

The No. 1 iron used in the previous mixture can now be used as the No. 2 iron and the No. 2 and No. 3 irons weighed in equal proportions will have an average of 1.05 per cent silicon and can be used as the No. 3 iron in this mixture. It is only necessary to use a quantity of the iron having 1.95 per cent silicon which is the only new iron added to the mixture. Having used the other irons in a former mixture and found that these were running properly, this mixture has been completely changed by the addition of one new iron.

In the examples shown, the different grades of pig iron used are in the exact proportion to each other. It is not always possible to have the different grades in the exact proportion, and while the No. 2 iron might be a few points in excess of the exact ratio, the No. 3 iron may be chosen a few points below the exact ratio, and using these in almost equal quantities will accomplish the same result.

Piling Pig Iron

On pages 74 and 75 of "The Production of Malleable Castings" by Richard Moldenke, he explains his method of piling pig iron into three distinct piles. If this method is used the silicon in the different grades of iron can be specified so as to have the approximate proportion to each other, to fit in with this method of calculating mixtures. It would be advisable, however, to have some irons somewhat higher and lower in silicon in order to be able to make decided changes in the mixture when furnace conditions warrant such changes.

This method can be used for calculating any size heat using any amount of sprue, and having any grade required so as to have the desired silicon contents. Mixtures can be made using a No. 4 grade of pig iron and this may be necessary when running larger heats. These require a higher mixture and owing to the stock of sprues on hand, it may be necessary to use a lower silicon pig iron. Mixtures can be calculated leaving out any one of the three different grades, and using only two grades, or by leaving out two grades and using only one grade of pig iron with the sprue and scrap. If occasion demands that only a limited amount of the No. 2 iron

(*Continued on page* 48.)

Table V

Card Containing the Base Numbers For the Different Grades, and Also the Different Percentages, Together With the Base Number For the Different Percentages of Sprue and Pig Iron Required For the Different Size Heats.

Grade	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35
Size of heat.	Base numbers							
180	540	549	558	567	576	585	594	603
185	555	564	574	583	592	601	611	
190	570	580	589	599	608	618		
195	585	595	605	614	624			
200	600	610	620	630				

Percentages of Sprue and the Proportions of Sprue and Pig Iron Required For Heats of Different Sizes.

Size of heat.	38 per cent.	40 per cent.	42 per cent.	44 per cent.
	564	576	588	597
180	68.112	72.108	76.104	79.101
	580	592	604	613
185	70.115	74.111	78.107	81.104
	596	608	620	632
190	72.118	76.114	80.110	84.106
	612	624	636	648
195	74.121	78.117	82.113	86.109
	628	640	652	664
200	76.124	80.120	84.116	88.112

New Light on Iron Ore Reserves of the World

Results of Exploration and Development Make More Accurate Estimate of Tonnage of Deposits Possible—Some Very Interesting Features

By Edwin C Eckel

Those who are interested in the subject of iron ore reserves will recall that in 1910 the Eleventh International Geological Congress made a very carefully planned and detailed study of the world's iron resources. Reports were secured from all the known iron districts, and from most of the areas in which large ore deposits might reasonably be expected to occur. In each case these local reports were prepared by a geologist especially familiar with the district or area under consideration. This method of procedure had its disadvantages as well as its advantages, however, for individual experience, judgment and mining knowledge naturally differed greatly. In the final publication, the separate reports were preceded by a comprehensive and illuminating summary, prepared by Professor Sjogren; and this went far toward eliminating individual errors of judgment. Taken as a whole, the final report was fairly representative of the state of knowledge regarding iron ore reserves at that date.

Even at the time of its publication, however, there were several points to which attention might profitably have been called, and the desirability of some further discussion of the subject has increased since then. During the past few years, active exploration and development, by many different corporations and individuals, have greatly increased our knowledge of the iron ore deposits of North and South America at least; and have made it possible to substitute somewhat more definite figures for certain of the less certain portions of the International report. There have, of course, been very obvious reasons against publishing any critical and detailed discussion of this matter heretofore, but these objections have now disappeared.

The present paper is an attempt to summarize, in convenient form, the chief facts relative to the ore supplies of the world as they are now known, with particular reference to the ore reserves of North and South America, which may be regarded as tributary to the iron industry of the United States. The discussion is offered as a suggestion along the lines which have been noted, rather than as a final analysis, for there are still notable gaps in our knowledge of the resources of the two Americas. Some of these gaps will be noted in the course of the discussion. It will be understood, of course, that in preparing this summary I have made free use, not only of my own results in those districts with which I happen to be personally familiar, but of all available sources of information bearing on the other districts.

1. *The International Estimates of* 1910

As a basis for the discussion, the principal results of the 1910 work of the International Geologic Congress may be put into tabular form. The summary of world reserves given in that report is as follows, in metric tons which are practically equivalent to long tons:

Continent.	Ore tonnage.	Equivalent to metallic iron
Europe	12,032,000,000	4,733,000,000
N. America	9,851,000,000	5,152,000,000
All others	525,000,000	307,000,000
Total world reserve	22,408,000,000	10,192,000,000

The above tonnages were called "actual" reserves, and included such ores as were commercially available for present day requirements. In addition, an immensely large "potential" reserve tonnage was reported, including ores which, because of location, low grade or lack of definite information, could not be considered immediately available. It may be noted, for example, that the Brazilian tonnage was classed as "potential."

We are particularly interested, of course, in the way in which the North American totals were made up. This is shown in the following tabulation:

Country or District.	Ore tonnage.
Newfoundland	3,635,000,000
Canada	no data
United States:	
Lake Superior	3,500,000,000
Clinton ores	505,300 000
Miscellaneous ores	253,000,000
Mexico	55,000,000
Cuba	1,903,000,000
Total North America	9,851,000,000

The total reserve credited to the United States, something over four billion tons, is less than that determined several years previously by Hayes. This difference is due largely to the fact that the International report did not credit any portion of the Texan tonnage to the class of "actual" reserves, placing all of it in the "potential" class. As regards the large tonnage credited to Newfoundland, the facts in the case are discussed later in this article. The entire omission of Canadian ores from the "actual reserve" class was due to the lack of really definite data on the subject.

One further point made by the International report needs some attention, for it has been strikingly reversed by later developments. Reference is made to the great scarcity of high-grade ores. A table covering this matter may be summarized as follows, showing the chief ore reserves over 60 per cent iron, (1910 report.):

Country.	Reserves high-grade ore.
Russia	99,000,000
Sweden	1,095,000,000
Mexico	55,000,000
Cuba	3,000,000
Australia	49,000,000
Total world reserve	1,301,000,000

Concerning this question, Sjogren remarks: "From the table it is evident that about four-fifths of the known and recorded rich iron ores come in the deposits of Northern Sweden. The high-grade ores, such as for example Kirunavaara, will therefore in future be very much in demand and the possession of such ore resources will form a decisive factor in the competition in the market of the world." Comment on this phase of the ore-reserve question will be made later in the present article.

The principal final results of the work of the International Geological Congress have now been briefly summarized. It is now possible to go over certain phases of this work, and to determine what changes are possible in view of later developments of more detailed local information.

2. *Ore Reserves of North America*

Most of the changes, in this regard, occur of course in connection with the ore districts on North America, for here we have much more precise data than were available to the International Congress in 1910.

Lake region data have not changed

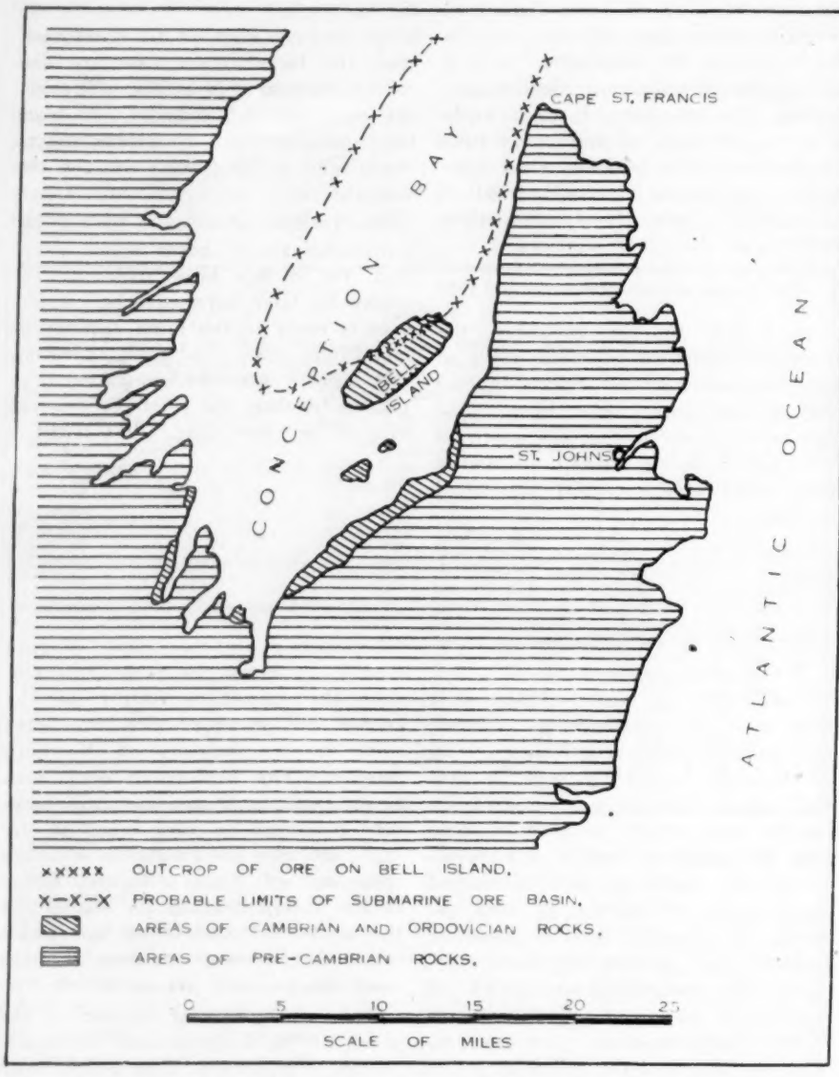
materially, but in some of the other districts extensive prospecting and development work has given a far more definite basis for tonnage estimates than was available until recently. As will be seen immediately, there are numerous ore districts and areas where the data for estimates are still insufficient. One of them happens to be the country first to be discussed.

Dominion of Canada.—It is still difficult to appraise the iron ore reserves of Canada, even in an approximate way. The known ore deposits of the Dominion are widely scattered over a very large area, and differ greatly in type. The intervening areas are, in many cases, little known.

At present, it can be said that any attempt to estimate the ore reserves must take account of certain tonnages of sedimentary Clinton ores in Nova Scotia; of a group of fairly large magnetite deposits in New Brunswick; of a number of smaller scattered magnetite bodies in Quebec and eastern Ontario; of some developments in the Canadian portion of the Lake Superior district; and of a series of contact deposits along the Pacific coast.

Of the ores named, pretty close estimates can now be made for those in Nova Scotia, New Brunswick and British Columbia; while the Quebec and Ontario tonnages can not be approximated very closely. Taken as a whole, it is probable that even the most conservative figuring would credit the Dominion with about one hundred and fifty million tons of known and partly developed iron ores; while a more enthusiastic view of the Lake ranges might increase this estimate heavily. For our present purposes, the lower figure named will be accepted.

In turning to the adjoining colony, we meet an entirely different situation, for Newfoundland possesses what is probably the largest ore tonnage in small area anywhere in the world. To add to its interest, this large reserve is almost entirely submarine.


CAPE ST. FRANCIS
CONCEPTION BAY
BELL ISLAND
ST. JOHNS
ATLANTIC OCEAN
××××× OUTCROP OF ORE ON BELL ISLAND.
×–×–× PROBABLE LIMITS OF SUBMARINE ORE BASIN.
AREAS OF CAMBRIAN AND ORDOVICIAN ROCKS.
AREAS OF PRE-CAMBRIAN ROCKS.
0 5 10 15 20 25
SCALE OF MILES

MAP OF WABANA ORE BASIN, NEWFOUNDLAND

The known and developed ores of Newfoundland are found in the southeast portion of the island, and occur as a series of sedimentary beds, in rocks of early Ordovician age. They agree in origin with our own Clinton or red ores, but are of somewhat earlier geologic age. About a dozen ore beds have been located and described in various reports, but three of these are workable. These three workable beds give an aggregate average thickness of ore of close to 30 feet. The ore is a very dense red hematite, grading 52 or over in iron, and the tonnage per square mile of ore territory is therefore very heavy.

The ore beds and their associated rocks occur in a trough or basin. The southwestern end of this trough outcrops on Bell Island, from which the rocks and ore beds dip northwardly under the waters of Conception bay. The accompanying sketch map will serve to give some idea of the surroundings and geology of the entire area involved in the question of reserve tonnages.

Geologic studies give reason to suppose that the ore beds continue northwardly, about as shown on the map. If we assume that they can be worked as far out as Cape St. Francis, the ore trough up to that point might contain some ten billion tons of ore. A certain portion of this area will be difficult to work; and in the worked portion heavy allowance must be made for ore left to support the roof. Discounting for these factors, we may fairly assume that the Wabana trough contains some four thousand million tons of recoverable ore. About half of this tonnage is controlled by the Nova Scotia Steel & Coal Co.

United States.—With regard to the iron ore reserves of the United States, there are available a number of different recent estimates, differing little as to the facts of the case, but made on different bases as to grades and commercial conditions. An estimate which I prepared a year or so ago seems to fit in best with our present purposes. It is as follows:

Reserve Tonnages, United States.

District.	Minimum.	Maximum.
L. Superior region	2,000,000,000	2,500,000,000
South'n red ores.	1,500,000,000	2,000,000,000
Texas brown ores	600,000,000	1,000,000,000
Oth. south'n ores	500,000,000	750,000,000
No'eastern states.	300,000,000	600,000,000
Western states...	300,000,000	700,000,000
Total U. S....	5,200,000,000	7,550,000,000

To this estimate, as originally

made, was added the note that it included only ores of present-day commercial grade—such ores as are now used during years of business prosperity. It does not include the enormous reserves of very low-grade red ore in the south, or the low-grade siliceous ores of the Lake region. The minimum figures in each case represent the lowest estimate which anyone, writing today, could possibly credit to the various districts. The higher figures represent the tonnages which may fairly be hoped for and are, in my opinion, the closer to the truth. For the purposes of the present article, the maximum figures may be accepted tentatively. The Texas maximum might be decreased somewhat; on the other hand, some of the other southern ore tonnages might be increased.

Cuba. — The high-grade hematites, which formed the original source of Cuban ore shipments are derived from a series of deposits on the south coast, near Santiago. These deposits are now estimated to contain, according to various engineers, a total of from five to eight million tons of ore. Similar ores occur elsewhere in Cuba, as well as in Porto Rico; but no large additional tonnage can be credited to them.

Cuban Brown Ores

With regard to the brown ore deposits which fringe the eastern portion of the north coast of Cuba, the situation as regards reserve tonnages is very different. These brown ores cover extensive areas, and the deposits are fairly regular in thickness, character, etc. Current estimates from various sources agree closely in placing the total known tonnage of crude ore at about three thousand million tons. This corresponds to approximately two thousand million tons of dried commercial ore, but in the present discussion the crude ore figures will be used and the necessary correction can be made by using also the crude ore average grade, say 35 per cent natural.

Mexico, Etc.—From Mexico and Central America, we receive, at frequent intervals, very enthusiastic estimates of new or well-known iron ore deposits. Unfortunately, when traced down, almost all of these Mexican and Central American iron ores appear to be found either as contact deposits or as ordinary gossan ores. In either case, tonnage estimates are likely to be made too high, owing to the excellent appearance which ore deposits of these types present at the surface. The tonnages actually known to exist in Mexico and Central America might perhaps be placed at fifty million at least; more optimistic estimates might run as high as one hundred million.

3. *Ore Reserves of South America*

In attempting to appraise the iron ore reserves of South America, it is best to realize, at the outset, that enormous areas of that continent are still practically unknown, so far as their ore possibilities are concerned. On the other hand, there is very satisfactory knowledge of the reserve tonnages of certain limited areas; and one of these areas happens to contain the largest known tonnage of high-grade ore in the world. Under these circumstances it is possible to summarize the existing state of knowledge with fairly definite results, even while admitting that there are obvious gaps in that knowledge.

For geological as well as geographical reasons, it would be advisable to separate the South American ores into three groups, but because of the various company interests involved, this will not be done at present. The ores of the north and west coasts will be grouped together; while those of the Brazilian area will be discussed separately.

Brazil.—The existence of large iron ore deposits in Brazil has been known for many years, but it is only within the past few years that these deposits have given promise of becoming active factors in the ore industry of the world. Their grade and tonnage are such as to overcome disadvantages of location.

The Brazilian ores which require consideration at present are located in the state of Minas Geraes, and outcrop over extensive areas. They are hematites, high in iron and normally low in phosphorus. The deposits have been examined by many geologists and mining engineers—among whom may be mentioned Harder, Merriam, Chambers, Leith and Kilburn Scott; and there is substantial unity of opinion as to their main features.

Origin of Brazilian Ores

As to origin, the Brazilian ores are regarded as sedimentary, occurring in original bedded deposits, with no trace of the secondary concentration which has been so effective in the Lake Superior region. As to tonnage, estimates by Merriam and Leith would justify the assumption that some 7,500 billion tons of ore exist, of which perhaps half will grade over 64 or 65 per cent metallic iron, and with phosphorus below the Bessemer limit. The remainder will grade between 55 and 65 per cent iron.

The industrial significance of these figures as to grade and reserve tonnage requires little comment. The tonnage cited is three times that credited to the Lake Superior region; the average grade is that of ore which at one time existed on the lakes, but which has disappeared from circulation.

Venezuela, Chile, Etc.—It is highly probable that in future large deposits of residual brown ores, similar to those of the north coast of Cuba, will be located in South America, but at present the known ore deposits, outside those of Brazil, are of two different types. In Chile, and for that matter all along the west coast of South America, there are a number of deposits of high-grade ores, often mixed magnetite and hematite, and apparently similar in origin and character to the contact deposits of Mexico and British Columbia. The known deposits of Venezuela, on the other hand, appear to be more closely allied to the magnetite deposits of the Adirondacks and other portions of the eastern United States.

Taking the Venezuelan and Chilean deposits together, it seems probable that two hundred million tons would be a fair estimate of the ore which has been prospected and partly developed to date. There are, of course, large possibilities in excess of this tonnage, but on the other hand, some of the deposits are of a type whose tonnage it is particularly easy to over-estimate. A maximum estimate, to cover probable development, might run as high as five hundred million tons for the ores of the northern and western portions of South America.

4. *The World's Iron Ore Reserves*

When we turn from the New World to the Old, we find that only one of the older continents has been sufficiently examined to permit even an approximate estimate of its iron ore resources. In view of the scanty information available concerning the greater portions of Asia, Africa and Australia, it would be folly to add their small known reserves to the fairly well-determined reserves of Europe and the two Americas—and then call the result a world total. It will be far better to omit the three unknown continents from the total, in which case the result obtained will be substantially an estimate of that portion of the world's iron ore re-

(*Continued on page* 48.)

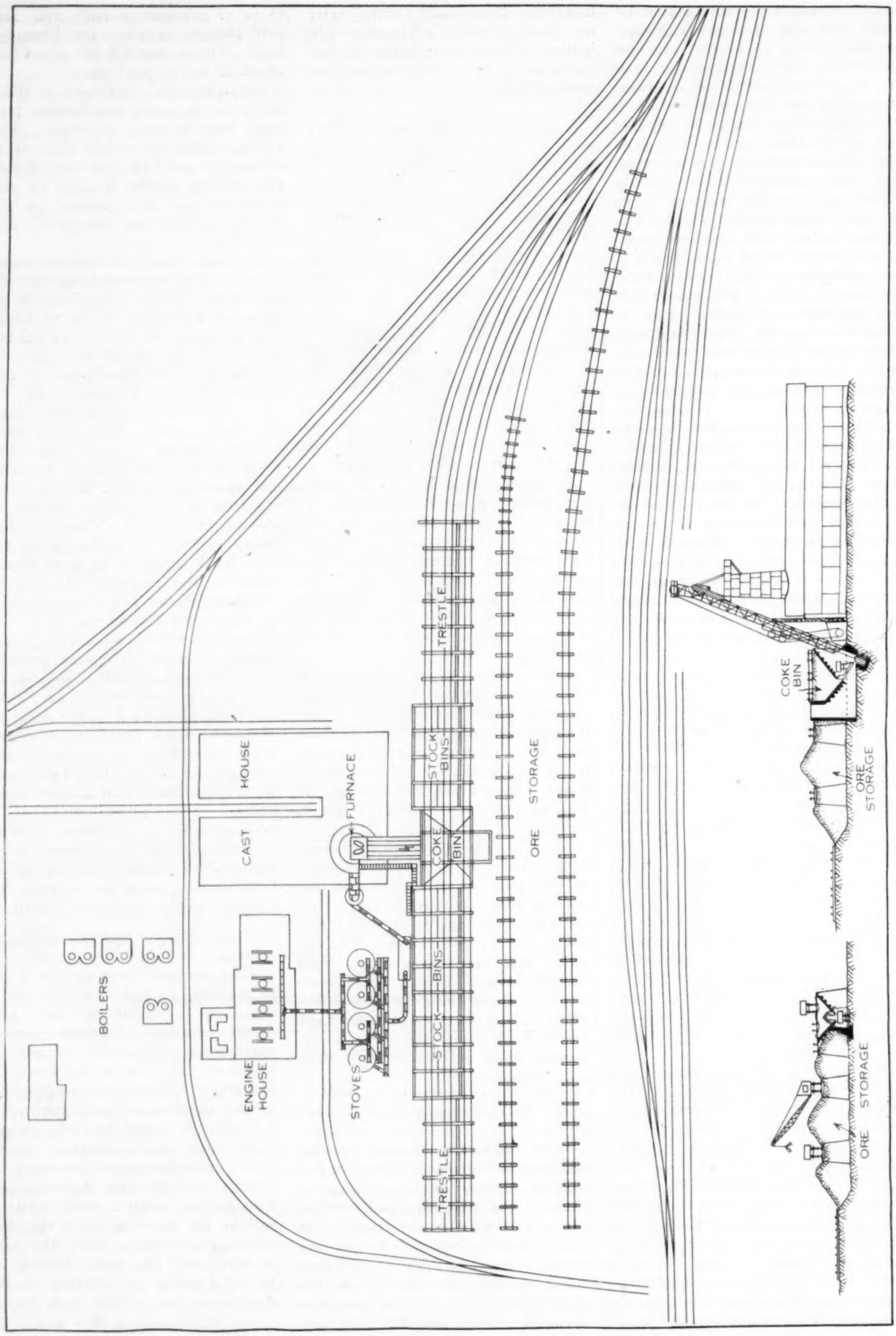


FIG. 1—GENERAL PLAN, SECTION THROUGH ORE STORAGE AND ON CENTER LINE OF FURNACE OF THE KEYSTONE PLANT OF THE READING IRON CO.

Blast Furnace Plants of the Reading Iron Co.

How Two Stacks Have Been Modernized by the Installation of Labor-Saving Devices to Effect Economies in Production

Economy of operation has become a question of vital importance to eastern blast furnace interests. The competition of central west, lake shore and southern furnaces, together with the possibility of the entry of foreign pig iron as a factor in the eastern market has, in combination with other conditions, produced a situation which demands that eastern furnaces be modernized thoroughly and equipped with labor-saving devices. Eastern furnace plants built in recent years and plants that have been modernized are, for the most part, well prepared to meet competition and low prices; on the other hand, plants that have not been remodeled are necessarily operating in *good times* at a considerable disadvantage and in *bad times* cannot be operated without a loss.

The Reading Iron Co.'s blast furnace plants are located at Emaus and Reading, Pa., the former being known as the Crumwold furnace and the latter as the Keystone furnace. These plants originally were built as *barrow, hand-filled* furnaces with vertical hoists and, realizing the situation previously outlined, the company decided some years ago to modernize both plants. The general arrangement of the Keystone and Crumwold plants are shown in Figs. 1 and 2, respectively.

One of the most important auxiliaries of a furnace plant, particularly in the east, is an ample ore storage yard. The advantages of transporting and unloading the winter's ore supply during the summer and autumn are important elements in the cost of operation.

At the Crumwold plant, the extent of the ore yard was somewhat limited by local conditions. By referring to the plan and elevations in

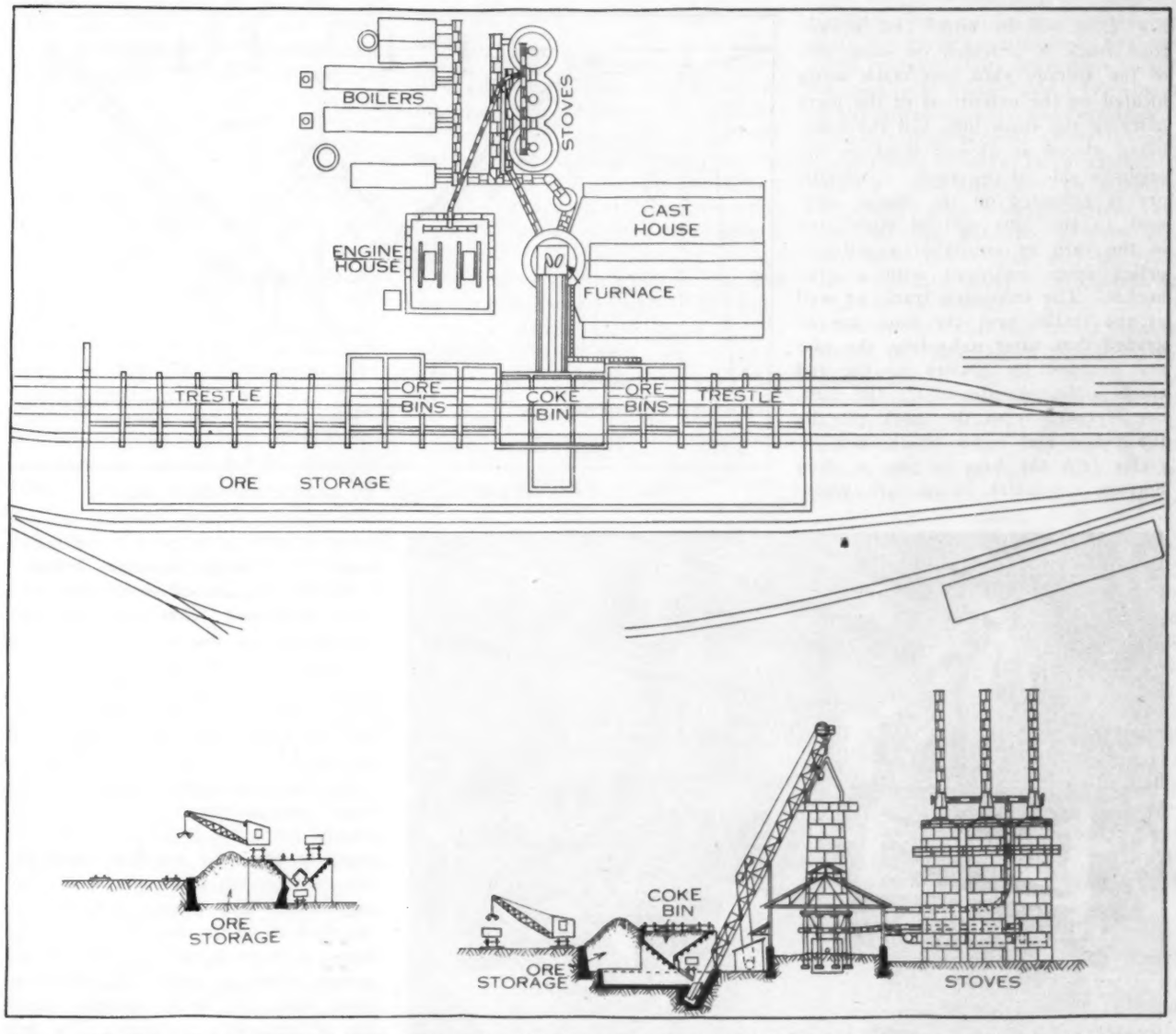


FIG. 2—GENERAL PLAN, SECTION THROUGH ORE STORAGE AND ON CENTER LINE OF FURNACE OF THE CRUMWOLD PLANT OF THE READING IRON CO.

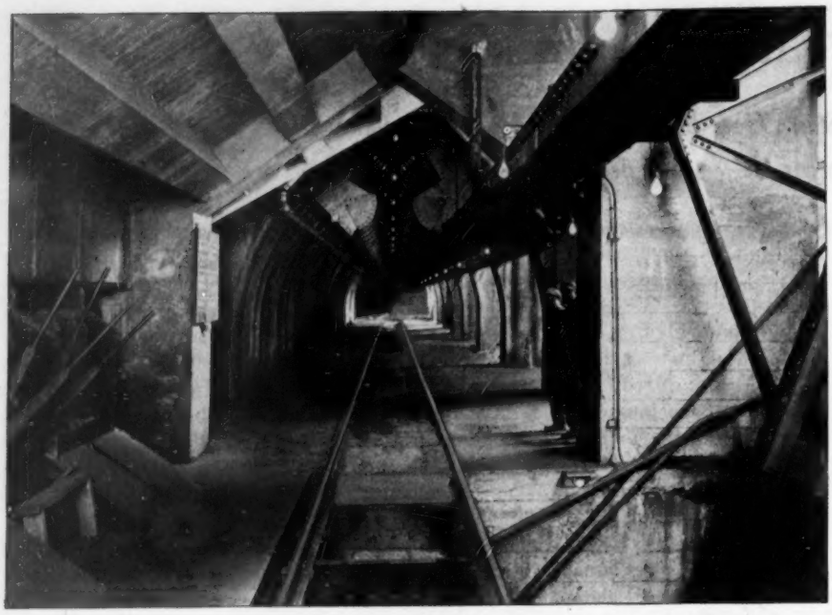


FIG. 3—A VIEW OF THE LARRY TRACK UNDERNEATH THE ORE BINS

Fig. 2, it will be noted that a railroad track is provided on each side of the storage yard, one track being located on the extensions of the piers carrying the stock bins and the other being placed at ground level on the opposite side of the yard. Generally, ore is unloaded on the tracks adjacent to the bins and is distributed in the yard by means of a self-propelled crane equipped with a grab bucket. The unloading track, as well as the tracks over the bins, are so graded that, after unloading, the cars are dropped by gravity to the tail track indicated. In filling the bins, ore is taken from the stock pile by the crane and either discharged directly into the bins or into a drop bottom car which is in turn transferred over and dumped into the bins. During the larger part of the year, a considerable quantity of the current ore supply is discharged directly into bins on its arrival at the plant.

At the Keystone plant, the ore storage yard, while much the same as the Crumwold yard in principle, is much larger in capacity. The plan and elevations shown in Fig. 1 indicate that three elevated railroad tracks extend throughout the length of the storage yard; any one or all of these tracks may be used for unloading ore, or for loading cars to be transferred over the bins. All tracks are carried by steel girders resting on reinforced concrete piers, the track next to the bins being supported on extensions of piers forming part of the bin construction.

While the self-propelled crane of the whirly type has been adopted for both plants, the design and arrangement is such as to permit the installation of a bridge traveling crane.

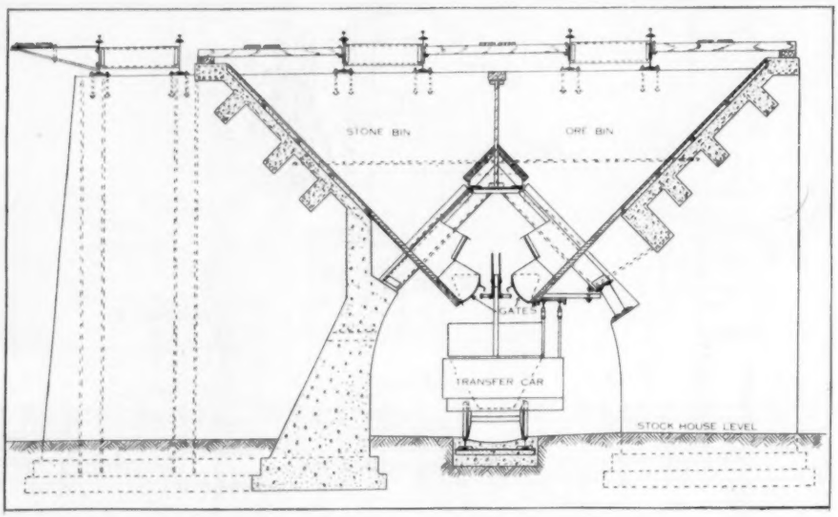


FIG. 5—TRANSVERSE SECTION OF CONCRETE STOCK BINS

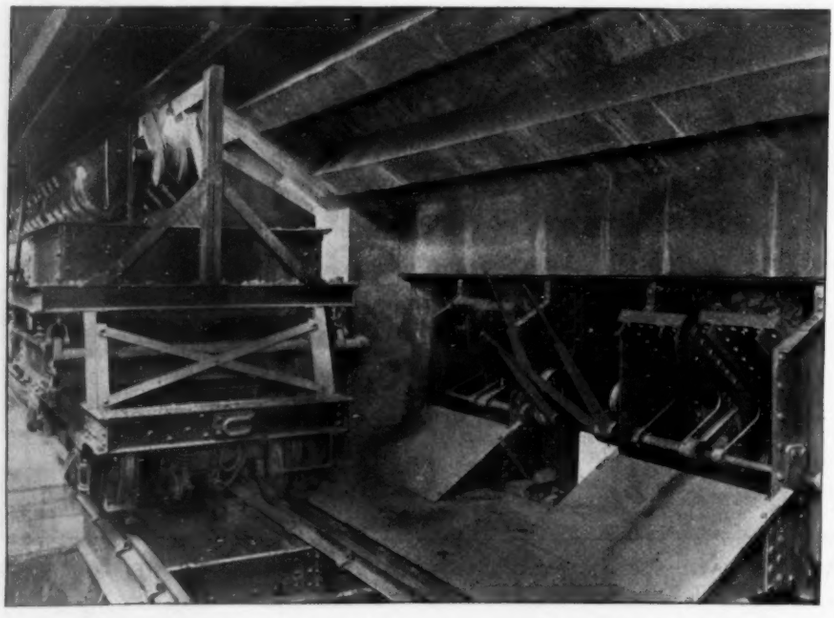


FIG. 4—THE LARRY CAR BEING FILLED FROM THE BIN POCKETS

Various designs of stock bins have been developed from time to time embodying the use of wood, steel or a combination of both. These designs are all, however, subject to serious objections arising from the decay of wood and the corrosion of the steel.

At the plants under discussion, the entire equipment of stock bins and trestle piers are built of reinforced concrete, the only wood entering into the construction being the maple lining of the bins proper, which is so installed as to be capable of easy renewal. There is thus provided a bin system which is practically indestructible, does not decay, require painting or expensive renewals. The first example of the use of reinforced concrete for stock bins was at the plant of the Richard Heckshire & Sons Co.,

now the Alan Wood Iron & Steel Co., described in THE IRON TRADE REVIEW, July 25, 1907; this plant and the plants under discussion were designed by the same engineers.

The ore and stone bins are of the double type with a railroad track supported by steel girders over each row. The Crumwold plant is equipped with eight ore bins and four stone bins, while at the Keystone plant there are provided 16 ore bins and eight stone bins. In both instances the row of bins next to the ore yard is devoted to ore.

The sections of the bottom of ore bins adjacent to the gates, are made of cast iron plates containing pipe coils through which steam is circulated in the winter to prevent freezing.

An electrically-operated bottom dump transfer car, equipped with scales, transports the ore and limestone from the bins to the skip hoist. The bin gates are of the pivoted type arranged to be operated by a lever carried by the transfer car, thus avoiding the expense and complication of a separate lever and operating apparatus for each gate.

One coke bin of large capacity discharging directly into the skip cars, is provided at each plant. Coke may be delivered to the bin on any one or all of the three overhead tracks. The coke on its way to the skip cars passes over screens, the braise falling into a pit located under the coke bin. This pit extends beyond the coke bin a distance sufficient to enable the braise to be taken out of the pit by a bucket and traveling crane located on the outer track over the coke bin.

The general design of the stock bins and the relative position of the stock transfer car is shown in Fig. 5. The design of the bins is further illustrated by Figs. 3 and 4.

Furnace Construction

Both furnaces are equipped with double skips and furnace charging apparatus of the Roberts type. The hoisting equipment in each case consists of Otis steam engines located at ground level. The starting levers for the hoist engines, the control of the bell cylinders, the bell indicators and the furnace sounding apparatus are all located in the hoist engine house.

The furnaces proper are constructed with steel shells supported on cast iron columns; the bosh cooling equipment consists of a combination of cooling plates and spiral water trough surrounding the larger portion of the bosh. Crumwold furnace is 75 feet high with a bosh diameter of 16 feet 1 inch and a hearth diameter of 10 feet. Keystone furnace is 79 feet high with a bosh diameter of 18 feet and a hearth diameter of 12 feet.

The stove equipment at the Crumwold furnace is being replaced by three Roberts stoves of the three-pass type; while the stove equipment at the Keystone furnace consists of four Massick & Cooke three-pass stoves built some years ago.

Power Plant

No additions, except electric generators and engines, have been made to the power at either plant. At the Crumwold furnace the power equipment consists of 1,500 horsepower of boilers, two blowing engines having 84-inch diameter Southwark air cylinders by 84-inch stroke and the usual outfit of pumps, electric engines and generators.

The Keystone furnace is equipped with 2,000 horsepower of boilers, two blowing engines having air cylinders 76 inches in diameter by 48-inch stroke, two blowing engines having air cylinders 84 inches in diameter by 60-inch stroke and the necessary pumps, electric engines and generators.

This new construction work was designed and erected under the supervision of Frank C. Roberts & Co., engineers, Philadelphia.

Low Grade Fuel for Motor Trucks

By a continuous run of 128 hours, with the exception of two brief stops of a few seconds each, a motor truck built by the Kissel Motor Car Co., Hartford, Wis., demonstrated at the Los Angeles commercial vehicle show recently that the very lowest and cheapest grade of fuel, namely oil toppings, can be used in gas engines. This test verified the results of a recent trip from Los Angeles to San Francisco by a Kissel truck which made this trip at a fuel expense of less than $1.40 for the 472 miles covered. The truck at the Los Angeles show was driven at a rate of approximately 20 road miles an hour and the mileage made was 2,560. When the spark plugs were removed they contained some encrusted carbon, but the soft, spongy deposit was absent. There is a slight odor from burning oil toppings, but it is claimed that it is not as unpleasant as the odor from too rich a mixture of higher grade fuels.

Book Reviews

Investigating an Industry, by William Kent; 112 pages, published by John Wiley & Sons, Inc., New York City, and furnished by THE IRON TRADE REVIEW, Cleveland, for $1.

This work constitutes a scientific diagnosis of the diseases of management, and with a few slight alterations, is a reprint of nine articles published by *Industrial Engineering* during 1913. It discusses the application of the principles of scientific management to all industrial problems, including those of distribution and selling and incidentally treats of some of the causes of the high cost of living. Henry L. Gantt, in an introduction to this work, points out that Mr. Kent has not attempted to place before the public a new idea, but that he simply is elaborating an old one and the entire book is based on the old saying "look before you leap". He makes clear that it is not only the new enterprises that must be investigated, but that in every established business every function of its operations should continually be known and a knowledge of the advantages or disadvantages it possesses with regards to its competitors should always be available, if possible. The literature on scientific management, to a large extent, relates to shop practice, whereas Mr. Kent is of the opinion that the term really includes everything concerning a factory or industry. Prof. Gantt is of the opinion that this broad conception of the meaning of the term undoubtedly is correct, and he points out that the task of the future is to get this scientific method applied to all industrial problems. The work is well written and its narrative style is conducive to easy and rapid reading.

Investigation of the Physical Properties of Cast Iron, by C. Jungst; 203 pages, published by *Stahl und Eisen,* Dusseldorf, Germany, and furnished by THE IRON TRADE REVIEW, Cleveland, for $3.75 postpaid.

This German work is a compilation of 6,301 tests of cast iron covering a thorough investigation of its physical properties. These tests were made in a large number of German plants and represent German practice generally. Foundry investigators will find this work of considerable value, as it has been carried out to a large extent along original lines.

The general sales and engineering offices of the Quigley Furnace & Foundry Co. have been removed from Springfield, Mass., to 105 West Fortieth street, New York.

Machining a Triple-Staggered Tooth Steel Gear

This Wheel Was Built in Six Sections by the Mesta Machine Co. for Installation in the Plant of the Inland Steel Co.

The Mesta Machine Co., Pittsburgh, recently built a triple-staggered tooth steel gear for the Inland Steel Co., Chicago, which is believed to be one of the largest of its kind ever built. The gear will be employed for driving a sheet mill in the Inland company's works and this gear and a pinion will effect a single stage speed reduction from the motor to the mill. As shown in Fig. 1, the gear is 22 feet, 8 inches in diameter, has a 38-inch face and 5½-inch circular pitch. The mating pinion is 2 feet, 11 inches in diameter. The gear has 154 teeth and the pinion, 20 teeth. The design varies from ordinary practice inasmuch as the teeth are staggered in three sections. Owing to the axial motion to which the drive is subjected, it was necessary to use a spur gear. Herringbone gears were not considered because of the unequal pressures that would be exerted on the side of the tooth face. The gears travel at a speed of 2,000 feet per minute and owing to this high speed the gears were carefully cut, the teeth staggered and the drive was arranged to run in an oil bath.

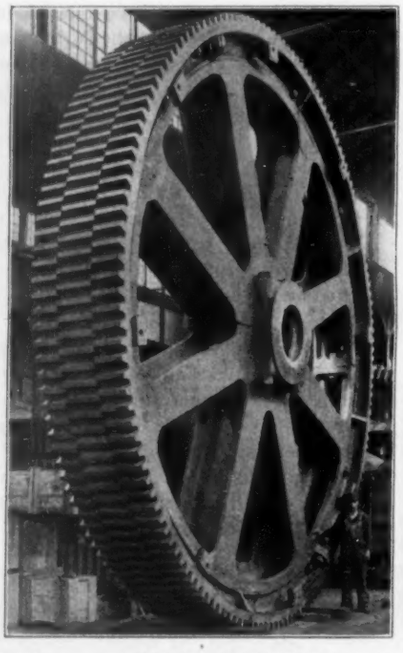


FIG. 1 — TRIPLE-STAGGERED TOOTH GEAR ASSEMBLED IN THE PLANT OF THE MESTA MACHINE CO. BEFORE SHIPMENT

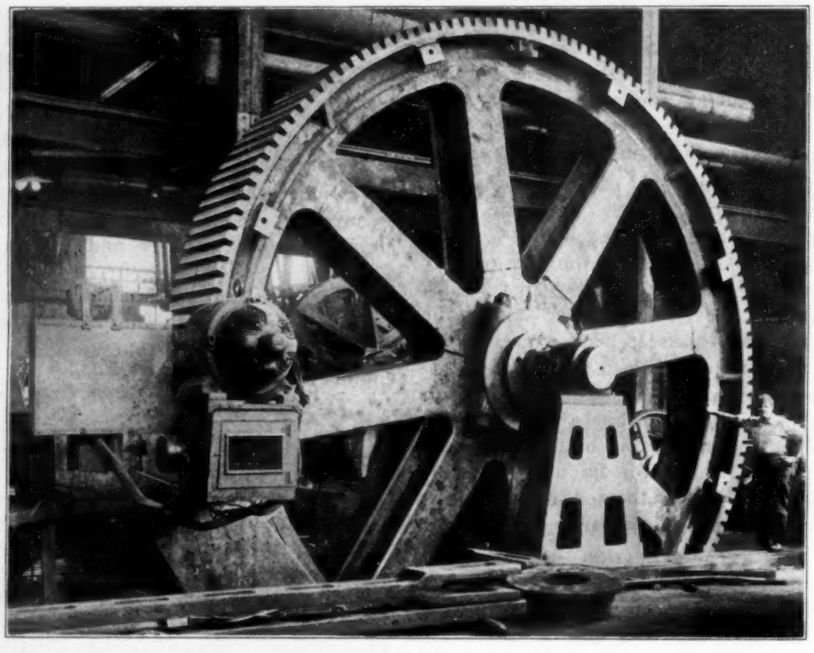


FIG. 2—THE LARGE GEAR IN THE PLANER, SHOWING THE METHOD OF CUTTING THE TEETH OF ALL THREE SECTIONS AT ONE TIME

The large gear in the planer, showing the method of cutting the teeth of the three sections at one time, is illustrated in Fig 2. The planer was built by the Mesta company. In this machine the tool is driven directly by a heavy lead screw which is operated by a variable speed reversing motor.

The gear is built in six sections. The gear center, including the arms, etc., carries the central rim segments of teeth. The two halves of the gear are bolted together and the separate rims are fastened to this by bolts extending through the side of the central casting.

Beginning with the rough casting, the operation of making this gear will be described. After annealing, the joints at the hub end rim of the central portion of the gear were planed. These joints then were drilled, reamed and the two halves were bolted together. The wheel then was placed in the pit lathe, the gear center turned down to the correct diameter and the surface was machined where the rim segments were to rest. The main gear then was taken from the lathe and the rim segments machined. Lugs were cast on these segments to assist in holding the work on the face plate. One segment was bolted on the face plate and machined and then was reversed and the other side machined to size and the segment was turned to correct diameter. The surface of the segments to rest on the main gear also was machined at this time.

The rims next were bolted securely to the main gear center with all the teeth in a line across the face of the gear, as illustrated in Fig. 2. The teeth then were planed through the center section and both side sections at the same time. The final cut was taken on the gear without removing the tool during the entire cutting operation.

The method of machining the mating pinion was similar to that of the large gear. After the teeth were cut the bolts were taken out and the two side sections were shifted on the center section to give the proper stagger. This was accomplished by the use of an indicating micrometer to eliminate the slightest variations from the exact dimensions. After the stagger of the teeth of the pinion was set, the teeth of the large gear were set to match the pinion. Holes then were drilled through both rims and the center of the gear and after reaming, machined bolts were inserted. The gear was assembled complete in the plant of the Mesta Machine Co., as shown in Fig. 1, but subsequently was taken apart for shipment. The installation of the gear will be simple, owing to the fact that it is built-up of six sections which were assembled with machined bolts before being shipped. None of the machinery already installed will be disturbed by the installation of this gear.

Great Increase in Commerce is Predicted

As a Result of the Opening of the Panama Canal—Wealth of New Fields for the Manufacturers of Iron and Steel—Interview With Hon. John Barrett

With the opening of the Panama canal, which it is expected will take place next summer, the United States iron and steel manufacturers will be cast into the theater of action to strive with their European competitors for the supremacy of the great Pacific markets of our own and foreign countries.

Every advantage of nature and ingenuity of business industry will favor the United States makers and with vigorous efforts there is every reason why they should capture the greatly coveted prize which will be offered. Already the foreign iron and steel makers have been and are on the scene of this great industrial battle, while the United States manufacturers have been neglecting these golden opportunities. The domestic maker of iron and steel may as well make up his mind that, in this struggle his principal competitors will be most formidable. They will be the manufacturers of Great Britain, Germany and Belgium.

With the Pacific coast of our own country made readily accessible to the United States steel makers, there will also be opened to him the five great Pacific coast countries of South America, Colombia, Ecuador, Peru Bolivia and Chile, which have already developed commerce to the annual value of $300,000,000. Within the next decade, it is confidently predicted by John Barrett, director general of the Pan-American Union, that this handsome total will be doubled. It offers a striking index to the possibilities of the United States iron and steel manufacturers.

"With the static influence of immigration, and the elimination of the present handicap by the opening of the canal," said Mr. Barrett to THE IRON TRADE REVIEW, "the increased commerce of these great countries will soon be so vast as to stir the imagination. It should be firmly impressed upon the great iron and steel industries of the United States what a wealth of new, desirable business lies in the immediate future and at their very door.

"Approximately, a ship travels 9,000 miles today in going from Boston to Valparaiso. When the canal is available, the all-water haul between those ports will be under 5,000 miles, a saving of 4,000 miles. Converting this into dollars and cents, the resulting economy is patent. Those who venture into the virgin fields will be rewarded richly for their enterprise. Dividing the annual foreign business among the five Pacific coast countries of South America, we obtain these interesting data: Colombia, $26,000,000, only a small part of which crosses the isthmus; Ecuador, $22,000,000; Peru, $55,000,000; Bolivia, which has no port, $38,000,000, and Chile, most southern of Pacific coast nations, and also the most important commercially, $200,000,000, export and import business, only a little of which

JOHN BARRETT

the United States gets. Bolivia, it is interesting to note, furnishes one-fourth of the world's tin supply, a commodity which sells in London at $1,000 per ton.

"Although the people of South America entertain a strong feeling of friendship toward the United States, and because of this and also on account of the splendid quality of our manufactures, they are anxious to trade with us, but English and German manufacturers have long had a practical monopoly of the South American trade.

"The opening of the canal should change this trade in favor of the United States manufacturers, including the iron and steel makers. This country, when that waterway is opened, will enjoy a great geographical advantage, as it will put the American exporter in a superior position with respect to this particular territory. In reality, the big manufacturing and industrial centers of the United States will be thousands of miles nearer the west coast of South America than the producing zones of any possible competitors. Time and money will be gained clearly and should effect more than a counter balance over the present advantage of the position now held by European rivals."

Reference was made to the fact that the railroad business in South America has largely fallen into the hands of English companies, and the majority of contracts for the carriers, totaling a huge sum yearly, go to the mother country. There was an example even two years ago where the general manager of an important railroad in South America was able to place a contract for passenger and freight cars with a big United States manufacturer, securing a bid which the English makers could not meet. The cars arrived four months after the time stipulated, but the somewhat important item of wheels was overlooked. This carelessness on the part of the manufacturer created consternation, of course, but the fact that he obtained the contract shows what can be done even under the present handicap, if sufficient alertness is exercised by the United States maker. Then imagine, it was urged, what vastly increased possibilities he has with the canal as his great transportation aid.

"It is well known," continued Mr. Barrett, "that the United States holds first place among the countries of the world in the amount of coal and iron ore mined. Cogent statistics with regard to these and allied details were pointed out sharply in the report of the Isthmian Canal Commission, 1899-1901, from which an entertaining compilation was made by Prof. Emory R. Johnson in his report on the industrial and commercial value of the isthmian canal. With its vast raw materials at hand, combined with its semi-finished and finished capacities, the iron and steel industry of the United States should

stand as the peer of the world in getting the immense business which will be opened to it when the canal is in operation. While at a disadvantage in the competitive struggle for this trade, the American producers have already secured a desirable business.

"Of course, Europe is at present closer than the United States to the East Indies, Australia, China and Japan and oriental countries generally. Until the American canal route becomes accessible the American manufacturers and exporters of iron and steel and other articles will find their lower costs of production greatly handicapped by the larger expense of transporting their commodities to these promising foreign fields.

"It is plainly evident, as has been indicated from time to time, that the Isthmian canal will affect the iron and steel industry of the United States chiefly by lessening the time and expense of reaching not only the markets on our own and the South American Pacific coast, but those of the far east as well.

"The following figures showing the exports of our iron and steel products to foreign Pacific countries for the year ending June 30, 1912, are illuminating: China, including Hongkong, $2,591,044; Japan, $11,763,821; British Australia, $11,812,929; Chile, $7,475,410; Bolivia, $246,076; Ecuador, $595,555; Peru, $1,518,182; Colombia, $1,395,985. This makes a total of $11,228,208 to the five South American countries on the Pacific coast. Of these exports to Chile, the largest single product, according to value and tonnage was steel rails. There were 44,137 tons aggregating a value of $1,369,525 sent to Chile that year. In 1908 there were only 415 tons with a value of $14,282. Ranking next were steel sheets and plates, totaling 41,758,486 pounds, at a value of $1,044,814. This compares with 167,588 pounds valued at $4,122 in 1908. Wire exportations ranked third, the exportations being 26,381,119 pounds, with a value of $582,837, compared with 9,002,405 pounds, valued at $211,375 in 1908. Other iron and steel exportations to Chile included bars and rods, electrical machinery, sewing machines, steam and other power engines and their parts, nails and spikes, pipes and fittings, and woodworking machinery. Wire sent to Colombia in the fiscal year 1912 totaled 10,645,171 pounds with a value of $245,363. This compares with 4,367,301 pounds valued at $110,570 in 1908. These facts, denoting the character of trade with Chile and Colombia, are also, in a relative sense, applicable to the other Pacific coast countries of South America.

"It has been shown that the principal exports from the United States to Pacific countries are and will be breadstuffs, lumber, raw and manufactured cotton, petroleum and iron and steel products. The total exports of iron and steel products from the United States in the 10 months ending with October, 1913, were $251,672,076, comparing with $238,971,131 for the same period in 1912. For the fiscal year ending June 30, 1900, the total was $121,858,344. Figures for the fiscal year ending June 30, 1913, separating the various exportations into classes, have not been compiled. Exportations of iron and steel commodities to Pacific countries comprise, roughly, one-eighth of the total. With the canal in operation, the proportion of Pacific tonnage should increase greatly in behalf of the United States iron and steel manufacturers.

"Manufacturers of iron and steel being heavy commodities with a relatively low value per unit of weight, they naturally are a class of traffic fittingly adapted for water transportation. Because of this they will seek the canal route to the Pacific markets, deriving the benefit of low freight rates. Exports of iron and steel will be sent out from both the southern states and those above the Ohio and Potomac rivers. Special advantages are possessed by the southern states for the making and exporting of pig iron on account of their juxtaposition of coal, ore and limestone and the comparatively short distance of furnaces from the seaboard. It is clear that in shipping pig and other forms of iron to our western states, the Hawaiian islands and Pacific coast of Central and South America, by way of the Isthmian canal, Southern makers and the Gulf ports will be nearer the canal than producers in other sections of the country, and this, perhaps, will give southern mines, furnaces and mills a large share of iron and steel export trade to Pacific markets. Northern producers, though, will be placed in a position to compete most successfully, as the north Atlantic ports will offer a greater volume of shipping and trade with the east than the southern ports will have. In consequence, more abundant facilities for dispatching their exports will be available. The canal will open to the southern district a demand from the Pacific coast, including South America, for pig iron, inquiry for this commodity from that coun-

(*Continued on page* 49.)

Chile Wants American Products

G. H. Cornish, mechanical engineer, and Alfredo Piza, a merchant of Valparaiso, commissioned by the Chilean government, are at present in the United States to look over the markets here with a view to making large purchases. Among other things, the Chilean government is about to ask for bids for between 50 and 100 railroad locomotives, and, according to Senor Cornish, it is likely that a good number will be placed in this country. With Senor Piza he has been commissioned to study the locomotive building industry of this country. Chile already has two locomotive plants, which, combined, have a capacity of 18 locomotives each year. This is insufficient to meet the demand. The Longitudinal railway, recently completed, runs from one end to the other of Chile. There are already some Baldwin locomotives in that country. There is a lot of railway construction under way in Chile.

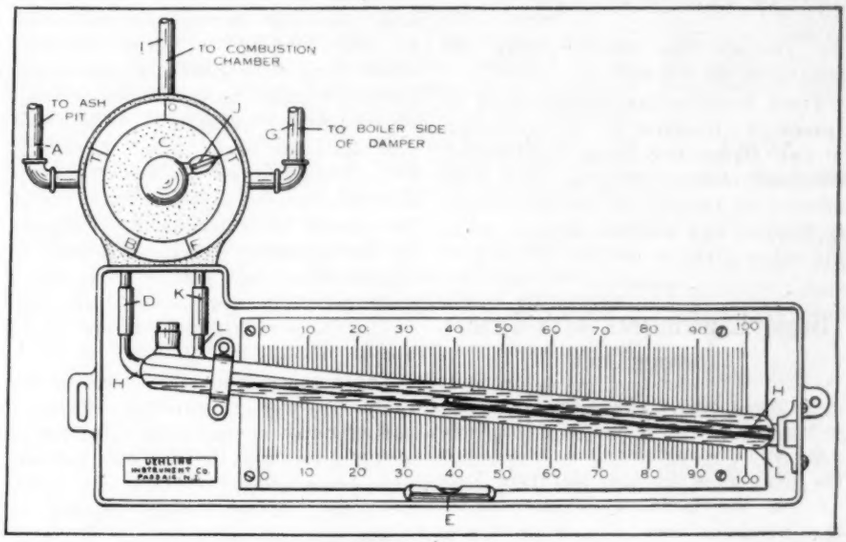
"In anticipation of the opening of the Panama canal," said Senor Cornish in a recent interview, "the government is spending a lot of money enlarging and improving the port works at Valparaiso. While English and German capital have come into the country, and the French are making pig iron at Corral, two of the biggest undertakings in the country are in the hands of Americans. The Braden Copper Co. operates enormous mines at Rancagina and has 5,000 men working for it. By far the biggest operation yet undertaken, however, is that of the Chilean Exploration Co., in which the Guggenheims are interested.

"The buying of American goods in Chile is on the increase. There is an enormous demand in the country for American agricultural implements. The electrical equipment business is now in the hands of the Germans, but the Americans ought to have it. American automobiles are finding a ready market."

The Uehling Draft Gage

The triple draft gage, built by the Uehling Instrument Co., Passaic, N. J., shown in the accompanying illustration, is designed to analyze the several factors composing the total draft which induces combustion. It consists of a metal box frame with a wide scale attached to the bottom. Attached to the front of the scale is fixed in an inclined position a large glass tube, *L*, containing a small tube, *H*, which protrudes from *L* at its upper end; *H* and *L*, respectively, are in communication with the five-way valve, *C*, through the connections *D* and *K*. A valve, *C*, further is connected through pipes, *A*, with the ash pit, *I*, with the furnace and *G* with the gas exit between the boiler and the damper. The valve, *C*, is operated by a movable index, *J*, which revolves in front of the dial upon which the letters *O*, *T*, *B* and *F* are shown. When the index points to *O*, *H* and *L* are in communication, respectively, with *A* and *G*, and the gage shows the total draft, that is, the drop of pressure between the ash pit and the damper. When the index is moved to *F*, *H* and *L*, respectively, communicate with *A* and *I*, and the gage shows the furnace draft, namely, the drop of pressure or resistance through the fire. If the index is moved to *B*, *H* and *L*, respectively, communicate with *I* and *G*, and the gage shows the boiler draft, that is, the drop of pressure between the furnace and the damper.

By the aid of this draft gage, the draft can be analyzed at any moment and the true conditions ascertained. This information will materially assist a fireman in obtaining good results. The gage, in addition to being applicable to boilers served with forced or induced draft, also can be used on those depending on natural draft, because it measures the resistance through the fire and the boiler separately or collectively, as desired, irrespective of the pressure in the ash pit.



THE UEHLING DRAFT GAGE

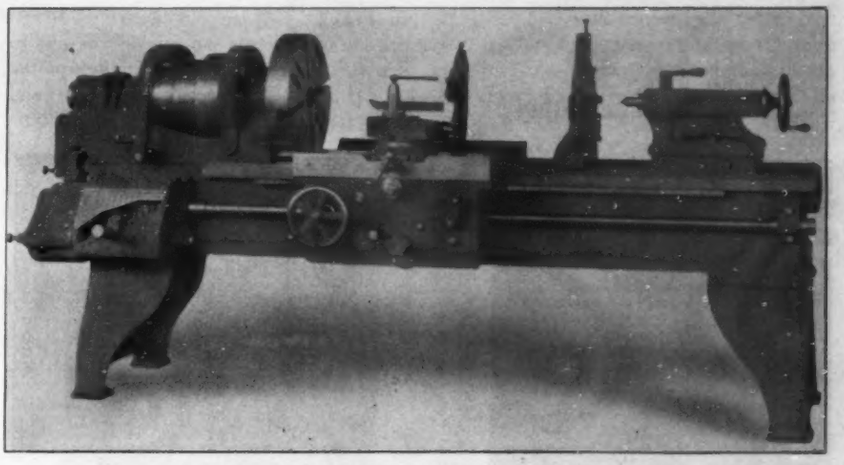


FIG. 1—FRONT VIEW OF 18-INCH ENGINE LATHE

A Quick-Change Gear Engine Lathe

An 18-inch quick change gear engine lathe, built by the Cincinnati Iron & Steel Co., Cincinnati, is shown in the accompanying illustrations. The lathe has a swing of 19½ inches, will take 1⅞-inch stock and will cut from 2 to 46 threads per inch with 38 changes of feed. The lathe is provided with a three-step cone and a double back gear, the latter being proportioned 10 to 1 and 3.17 to 1. The bearings both front and back are large, the former being 3½ x 5¾ inches, and the latter 3 x 4½ inches. All thread and feed changes are obtained instantly without the removal of a gear or stopping the lathe, the changes being effected by two pull pins and a tumbler in the change gear box. The apron is worm-driven by a steel worm gear and a bronze worm. The overhang is of the double plate type, providing ample back support for the studs. The half nut lever cannot engage accidentally and, with the non-interfering device, it is impossible to throw the feed and half

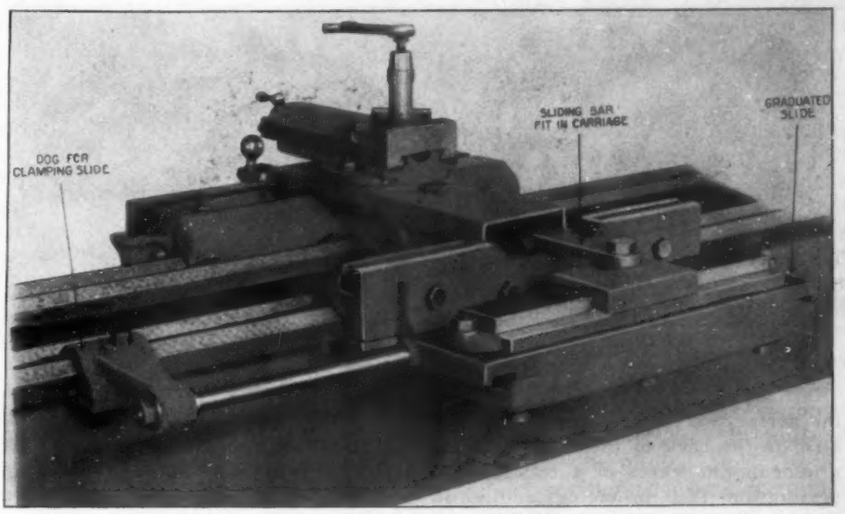


FIG. 2—TAPER ATTACHMENT OF 18-INCH ENGINE LATHE

nut in at the same time. The compound rest and cross feed collars are graduated and the machine is built in all lengths of bed from 6 feet upwards.

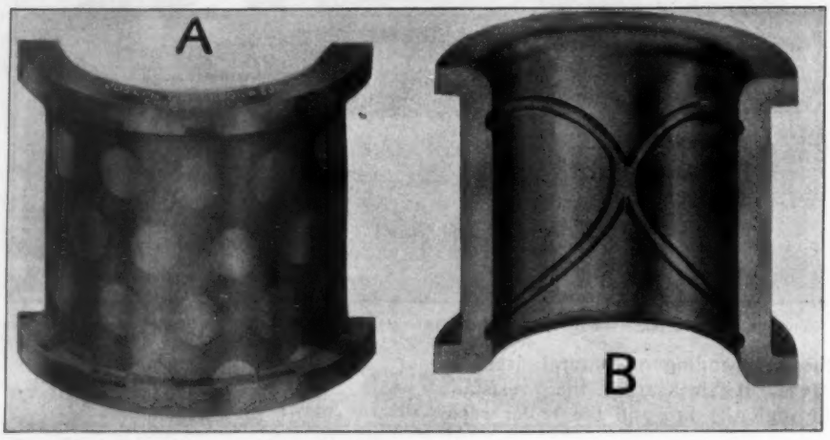


FIG. 1—EXTERIOR AND INTERIOR VIEWS OF REINFORCED BEARING

A Reinforced, Quickly Replaceable Bearing

The severe duties imposed upon connecting rod and crankshaft bearings on gas engines necessitate the use of a bearing sufficiently strong to withstand the strain of the severe stresses to which they are subjected. In the accompanying illustrations is shown a bearing of the skeleton type, which consists of a steel or bronze skeleton or reinforcement imbedded in babbitt metal. The framework or reinforcement grips the babbitt metal both in the flange and in the body of the bearing and gives it resistance and backing. The skeleton is so interlocked with the babbitt metal that the two are held together at every point. Before casting the bearing, the skeleton is pickled and tinned, which practically solders the babbitt metal to the skeleton. It also is apparent that when the skeleton is formed into a circle, the perforations necessarily are elongated on the back of the skeleton, thus producing the effect of a countersunk perforation and providing additional locking of the babbitt to the skeleton.

In Fig. 1, *A* is an outside view of the bearing and *B* is an inside view. In Fig. 2, *A* shows the skeleton before the babbitt metal has been cast onto it and *B* is a sectional view, which shows how the reinforcement appears when the bearing is cut through.

These bearings are manufactured by Joseph T. Ryerson & Son, Chicago, in two styles, one being machine-finished all over to decimal sizes, thus offering to the pin or journal a highly finished and polished surface, while the other style is die-cast to size.

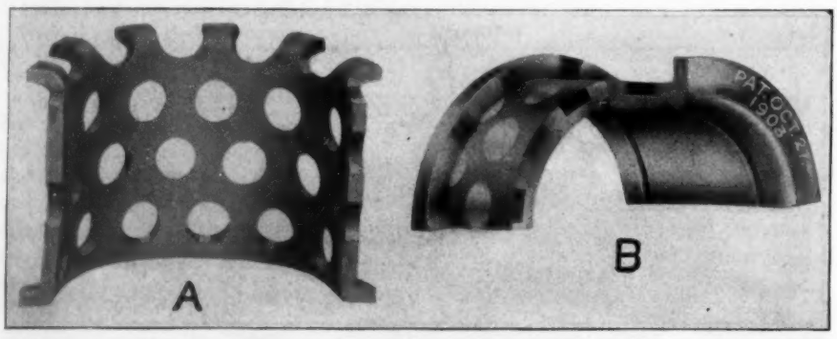


FIG. 2—THE SKELETON AND A PART SECTIONAL VIEW OF THE REINFORCED BEARING

Begin Experiments With Titaniferous Ores

Inauguration of extensive experiments to be made with New York state titaniferous iron ores was made the past week by the McIntyre Iron Co., at the Cedar Point furnace of the Northern Iron Co., Port Henry, N. Y. The McIntyre Iron Co., several months ago, as reported at the time, leased this furnace especially for these experiments, the tenure to run for six months beginning Jan. 1, 1914. The plant was turned over to the lessee a few days ago under the terms of this lease and now is being operated with charges of titaniferous ores drawn from the extensive deposits in the Lake Sanford district in New York state, owned by the McIntyre Iron Co. The ore is being concentrated and enriched at the mines before shipment to the furnace. At first, only a small portion of titaniferous ore will be charged into the stack and this quantity will be increased gradually as the experiments continue. F. E. Bachman, formerly general manager of the Northern Iron Co., at Port Henry, is furnace manager in charge of the experiments.

Has Not Leased Texas Blast Furnace

Reports that the Lone Star and Crescent blast furnace at Rusk, Tex., has been leased are denied by its owner, Edgar T. Leche, New Orleans. Mr. Leche, a member of the conservation commission of Louisiana, said that during the past year he has refused to grant options which have been asked by numerous parties, because he is anxious to sell the property outright. About one year ago, Mr. Leche stated, he granted a 90-day option to some western interests, but upon the expiration of the option he determined to dispose of the property direct by selling it. Philadelphia and other capitalists have taken up negotiations with Mr. Leche, but satisfactory terms could not be reached.

The furnace, with 188 acres, in the center of iron deposits in Cherokee county, was acquired by Mr. Leche in 1901, and operated by him for one year, after which the stack was blown out, Mr. Leche having decided to devote his time to Louisiana interests. It has been idle since that time. He said the iron he made, sold chiefly in the Denver market for making mining machinery, brought $19.25 per ton.

When Steel "Gets Tired"

A microscopic examination to ascertain the theory advanced by some that steel "gets tired" is to be started at once by the naval board of inspection and survey as the result of the broken shaft of the battleship Vermont. The board, acting under instructions, will not give out the date of the beginning of the inspection, but it is known that it is to be in the immediate future.

The inquiry, to be exhaustive, will take place at the Norfolk navy yard, and it is hoped to learn the causes for the breaking of the great main shafting on naval vessels.

The production of primary spelter in the United States in 1912 is estimated at 323,961 short tons.

IRON AND STEEL MARKETS

Improvement in the Iron Trade is Extending

Mill Activities Somewhat Greater Than Before the Holidays—Cast Iron Pipe Makers Buy Large Tonnages of Pig Iron—Steel Making Pig Iron Quotations Lower

BY GEORGE SMART

That the recent improvement in the iron trade is not merely sentimental, but rests upon a solid foundation, is being shown from day to day as new business expands and prices become less irregular. While the volume of business shows very comfortable increase, production increases slowly. Mill activities are, however, somewhat greater than they were before the holidays and the outlook for gradual additions to working forces is encouraging. The low price of bar iron for the past two months has resulted in reducing the wages of puddlers and there are scattering reductions in wages in different parts of the country, but this is by no means general, and in Chicago, no reductions in steel plants and mills have taken place. The American Sheet & Tin Plate Co. is now operating at almost its full capacity.

Bookings of fabricating material for the past week were over 50,000 tons, the best in a long time, of which 18,000 tons went to independent companies. The American Bridge Co. has finally closed for 32,000 tons for Jerome avenue and White Plain subway, New York City.

Some important sheet and tin plate companies are quoting present prices for early delivery only and are asking from $1 to $2 for forward delivery.

Pig Iron

The advance of $1 per ton by the Buffalo makers, who had been quoting $12, furnace, for No. 2 pig iron, has had a good effect on the market. This makes the quotation on this iron $15.45, Philadelphia, which is higher than the prices of eastern Pennsylvania producers and removes Buffalo iron as a competitor in Detroit, Pittsburgh, and other distant points. The United States Cast Iron Pipe & Foundry Co. has been a heavy buyer of iron suitable for making its product and its purchases are estimated at fully 30,000 tons of northern and southern brands in addition to other purchases recently made, while about 25,000 tons more are under negotiation for this buyer and other pipe makers. The Portsmouth Steel Co. has purchased from 10,000 to 20,000 tons of basic at about $12.90, Ironton. Bessemer has declined to $14, valley. Many melters of moderate tonnages of foundry grades have entered the market in different parts of the country.

Wire

Following the temporary withdrawal of quotations by the American Steel & Wire Co. and the announcement by that company of a basis of $1.55 for wire nails and $1.40 on plain wire, very large tonnages were contracted for by leading jobbers and manufacturers, the jobbers being limited to 60 days. The leading companies are rigidly adhering to the new quotations, but it is still possible to shade the new price $1 per ton with some of the smaller makers.

Coke

Curtailment of production in the Connellsville region is being continued and about 1,700 ovens controlled by the Producers' Coke Co. have been blown out since Jan. 3. This company is adhering firmly to a quotation of $2, ovens, on furnace coke on contracts, and it is very difficult to buy at a lower figure. Several furnace companies are negotiating for their coke requirements.

Plates and Shapes

Plate orders booked by eastern mills have come in more freely during the past week and there is less disposition to sell at recent low quotations. For prompt or first quarter delivery, 1.20c, Pittsburgh, is apparently the minimum on plates and shapes and one of the largest buyers in the Pittsburgh district has paid that price for its first quarter requirements.

Tubular Goods

The Philadelphia Co. has entered the market for 12,000 tons of iron and steel oil country pipe for first half requirements. This is an increase over its purchases of the first half of last year. Independent makers of iron and steel boiler tubes have adopted the lower prices recently announced by the National Tube Co.

Iron Ore

Shipments of ore from Cuba by the Juragua Iron Co., a subsidiary of the Bethlehem Steel Co., last year were about 375,000 tons, indicating that total shipments of Cuban ore were in excess of 1,600,000 tons, thus making a new record. There is no disposition among either buyers or sellers of Lake Superior ores to talk about prices and it is not probable that any action will be taken before March 1.

Ferro Alloys

A new feature of the ferro-alloy market is the policy adopted in some cases to guarantee the price against decline in making contracts for future requirements. This is an important concession to the buyer which has not heretofore been made. It follows the entrance of the United States Steel Corporation into the market as a seller of ferro-manganese in competition with German and English makers.

Scrap

In a very mild way, the scrap market, which has been most seriously depressed for many months, is showing improvement. No. 1 railroad wrought iron is quoted at $1 higher in eastern territory and some other advances are noted in other parts of the country.

Production Increased at Pittsburgh

Specifications Heavier Than for Months With Leading Companies—Pig Iron Does Not Share in Improved Demand

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, Jan. 13.

Several leading manufacturers of finished products in this district advise that specifications against contracts last week were heavier than those received in any similar period for more than three months, and business appears to be gradually improving. Belated inquiries for future shipment have come out in fair volume, and mill managers express the hope that demand will continue. Although prices have stiffened slightly since the first of the year, there have been no actual advances. Generally speaking, mills in this district are not running at more than 50 per cent capacity, but operations have been increased in a number of instances. The Allegheny Steel Co. has resumed operations in No. 2 department, idle two months, and expects to start No. 1 department Feb. 1; the Republic Iron & Steel Co. again is making steel in its Bessemer plant, which closed down three weeks ago; the Standard Sanitary Mfg. Co. has renewed operations in its Woods Run plant, down for a fortnight; the American Sheet & Tin Plate Co., for the first time in many weeks, is operating sheet and tin mills practically at full capacities, and other subsidiary companies of the Corporation have increased outputs this week. In sharp contrast to betterment reflected by increased mill operations, is the announcement that an independent blast furnace interest has made the first wage reduction in this district, while wages of union puddlers have been reduced 55 cents a ton for boiling, as the result of a decrease in the selling price of bar iron, and these men now are receiving the same rate that prevailed a year ago.

Pig Iron

The pig iron market has not reflected the improvement displayed to some extent by other lines. None of the heavy consumers is figuring on future requirements, and steel-making grades continue dull, at low prices. Numerous small lots of foundry and malleable have been sold, and one sale of 2,000 tons of malleable is reported. The Union Steel Casting Co. and the United Engineering & Foundry Co. have closed for Bessemer and foundry grades, although neither interest bought heavily. The National Radiator Co., Johnstown, Pa., has taken about 6,000 tons of first half foundry.

Foreign makers of ferro-alloys continue to ask $45, seaboard, for ferromanganese, and that figure is being held fairly well. Demand is light.

Plates and Shapes

Leading makers have withdrawn quotations below 1.20c, and one of the more important consumers in the district has paid that figure for first quarter requirements. Demand is slightly better, and specifications have come out more liberally this week. Plates are more irregular in this district than shapes, it being understood that some tonnage has been obtained as slightly less than 1.15c. Prospects for a car buying movement are brighter.

Sheets and Tin Plate

The American Sheet & Tin Plate Co. is operating tin and sheet mills practically at maximum capacity, for the first time in many weeks, and the Allegheny Steel Co. has resumed operations in department No. 2, containing six sheet mills, which were idle two months. Sheets appear firmer on the basis of 1.85c and 2.85c for black and galvanized products, and the 1.35c quotation on blue annealed sheets is less frequent. Tin mills are receiving heavy specifications.

Rails and Track Material

Specifications for steel rails the first two weeks of this month were considerably heavier than those received during the corresponding period in December, and indications are that new buying will be heavier shortly. Demand for spikes and other track equipment and tools has been satisfactory, although prices are low.

Semi-Finished Material

Open-hearth sheet bars have sold at $20, Youngstown, or $1 a ton less than the minimum figure at this point. Bessemer sheet bars are being held at $21, mill, and billets at $20, mill, throughout the district. We quote open-hearth sheet bars at a range from $20 to $21, mill, or $1 a ton less than previously. Wire rods are quotable at $25.50, although $26, Pittsburgh, is the minimum price offered by some makers. Muck bar is quiet, and the prevailing quotation nominal.

Bars, Hoops, Bands and Shafting

Steel bar manufacturers have withdrawn quotations below 1.20c, and that figure represents the prevailing market minimum. Fairly good demand is reported, and some makers are asking 1.25c for second quarter. Iron bars continue irregular. Shafting is quotable at a range from 63 to 65 off list for carload lots. Hoops and bands continue to be listed at 1.40c and 1.20c, respectively, although prices have not been tested recently.

Tubular Goods

The Philadelphia Co. has entered the market for 12,000 tons of iron and steel oil country goods for first half requirements. Tubing, casing and line pipe are involved in this inquiry, the largest to come out for some time. Independent makers of iron and steel boiler tubes have adopted lower prices which came out early in the year. Present quotations on boiler tubes are $2 and $4 a ton lower than those previously prevailing.

Bolts, Nuts and Rivets

The market continues irregular, and prices of nuts and bolts are nominal. Manufacturers report that specifications have been slightly better, but consumers show no disposition to cover future requirements.

Wire Products

Manufacturers have withdrawn quotations below $1.55 and $1.35 for nails and plain wire, and those figures appear stronger than at any time since first effective, last fall. Specifications against contracts the last few days have been heavier, and some new demand is reported. The market is quotable on the basis of $1.55 for nails, or $1 a ton above the price of a week ago.

Coke

Reports from the Connellsville regions early this week indicated that operations were being curtailed. Approximately 1,700 ovens controlled by operators identified with the Producers Coke Co. have been blown out since Jan. 3. The market at present is at a standstill, although several negotiations for first half blast furnace coke are pending. The bulk of the coke is being held at $2, ovens. Foundry grades are quiet, and some tonnage has sold at $2.40, ovens. *The Connellsville Courier*, for the week ending Jan. 3, says production was 252,151 tons, an increase of 16,066 tons, compared with the week before.

Old Material

Sentimentally, the market continues to show improvement, although sales have been too light to indicate the trend of the market. Heavy melting steel is being held at $11.25.

Substantial Basis for Western Optimism

Is Shown in the Chicago Market—Improved Schedules in Some Mills—Prices on Finished Materials Firmer

BY H. COLE ESTEP

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, Jan. 13.

Optimism, which has been a dominant characteristic of the western iron and steel markets for the past three weeks, now has a more substantial reason for its existence. Broadly speaking, more tonnage was booked between Jan. 6 and Jan. 13 than during any other week in the past four months. The buying has been well scattered and has been featured by a lack of large individual orders. The railroads are not, so far, dominant factors in the movement, which gives reason to believe that the turn has come in general industry and that business may show progressive improvement during the remainder of the year. Prices on all finished materials are firmer, but so far have not advanced beyond the 1.15c, Pittsburgh, minimum for bars and plates.

Since the holiday shutdown, plants have been running at a slightly improved pace. The Gary plant of the American Sheet & Tin Plate Co. has resumed and the Gary rail mill is on a better schedule. The Inland Steel Co. is operating 11 of its 12 open-hearth furnaces this week and reopened its hard steel bar mill Jan. 12. Seven of the 11 merchant blast furnaces in the Chicago district are operating.

Pig Iron

It is hardly to be expected that sales would continue very long at the rate set during the first week in January. Although there is considerable business under negotiation, the market is now enjoying a breathing spell. The buying movement did not serve to advance prices, but it at least put the situation on a firmer footing and stopped the decline. The Crane Co. has not yet covered for its requirements. Most southern producers are holding at $11, Birmingham, and we note sales of 900 tons at this figure. Considerable iron, however, is available at $10.50 for the first quarter. The Inland Steel Co. is operating both of its blast furnaces and will have some surplus basic pig iron for sale from time to time during the spring.

Merchant Bars

Business has improved perceptibly and the past week was one of the best in four months from a sales standpoint. Most of the tonnage placed was for early shipment and there is comparatively little buying for second quarter delivery, owing to the reluctance of the mills to contract. Some of the independents, together with the Steel Corporation, have taken a few bar contracts for the first six months and the bulk of this business has been placed at 1.38c, Chicago, equivalent to 1.20c, Pittsburgh. For prompt shipment, however, the ruling price is $1.00 a ton less, or 1.15c, Pittsburgh. This latter quotation may be withdrawn at any time; in fact, one of the eastern independent mills represented in this territory has nothing to offer at less than 1.20c, Pittsburgh. The announcement that the Steel Corporation has advanced its price to 1.20c, apparently does not affect the Illinois Steel Co. Smooth finished machinery steel is steady at 1.68c, Chicago. The Inland Steel Co. has resumed operations at its Chicago Heights plant, rolling rail steel bars. Enough business has been procured to run the plant on single turn for some weeks. The price of hard steel bars is hovering in the neighborhood of 1.30c, Chicago. Bar iron mills are operating a little more liberally, but the minimum price has slipped back to 1.12½c, Chicago. Shafting is fairly steady and warehouse business is reported satisfactory.

Plates and Structurals

The fabricators in the Chicago and Milwaukee districts have been ordering rather liberally for stock replenishment. Plates are still obtainable at 1.33c, Chicago, for shipment during the remainder of January, February and March. Practically no business for second quarter has been closed. Shapes are generally held at 1.20c, Pittsburgh, and it is believed that a few isolated contracts for first half have been closed. The plate and structural mills in this district are operating at about 60 per cent capacity.

Rails and Track Fastenings

Standard rail orders remain conspicuously absent from the rather encouraging tonnages placed recently. Buying of track fastenings and tie plates, however, has been liberal. One prominent western line has closed for 10,000 tons of tie plates and a liberal quantity of spikes and bolts. An electric street railway in Texas is inquiring for 12,000 tons of rails.

Sheets

With the exception of the Inland Steel Co., which is operating only eight of its hot mills, the sheet mills in this territory are running about 65 per cent capacity and business has been rather liberal during the past week. Outside mills, at least, seem to be willing to contract for the first half at rather low figures. We note a contract at 2.85c, Pittsburgh, for No. 28 galvanized for shipment until July 1. A Youngstown mill has sold 100 tons of sheets in this territory for first quarter shipment at 1.80c, mill, for No. 28 black, equivalent to 2.96c, Chicago. This is about the minimum for black sheets in this territory. A local mill has sold some No. 28 galvanized sheets at 2.97c, Chicago, for immediate shipment. One of the prominent local independent companies is not seeking any business beyond April 1, although it will not be long before some decision regarding prices for second quarter must be made by the producers.

Wire Products

Following the announcement that all quotations under 1.55c, Pittsburgh, for nails and barb wire had been withdrawn, there was considerable pressure from a number of buyers to get under cover. Quite a few contracts for 60 days have been entered and some for longer periods. The demand for wire from industrial sources has improved.

Cast Iron Pipe

Although no important tonnages were placed during the past week, considerable business is now pending. St. Paul closed for 3,230 tons on Monday. The letting at Winnipeg may be awarded to a Canadian producer. The City of Chicago will open bids Jan. 20 for 5,000 tons of 6, 8 and 12-inch water pipe. Prices are a trifle firmer.

Merchant Pipe and Tubes

Warehouse prices on steel pipe have been revised slightly to correspond with recent changes made in mill quotations. Iron pipe and boiler tube discounts are unchanged. There is a fair demand for pipe for local consumption. Inquiry for seamless tubes is light.

Bolts, Nuts and Rivets

Improvement comes slow to the bolt, nut and rivet trade. Agricul-

tural implement makers are specifying somewhat more freely, but up to date, prices have shown no general improvement. Structural rivets are somewhat firmer, the minimum now being 1.85c, Chicago.

Old Material

The scrap market is marking time and readjusting itself to new conditions. The demand is improving somewhat, but the quantity of old material available is still so large that the effect on prices will be slow. Dealers are asking higher prices, but with few exceptions have been unable to realize on their expectations. The Chicago & North Western has sold 7,600 tons of various grades of old material including 2,500 tons of rerolling rails and 500 tons of No. 1 wrought.

Improvement Spreading in the East

Still Prices Show Firmness and the General Tone is Better—Continued Activity in Pig Iron

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
326 Real Estate Trust Bldg.,
Philadelphia, Jan. 13.

An encouraging volume of new business in both pig iron and finished steel continued to appear in the eastern Pennsylvania market the past week. In steel this betterment was spread more generally among the mills and it has been noted with but very few exceptions. Steel prices exhibit firmness and the tone of the market is thoroughly stronger. Pig iron shows sustained activity. Many buyers are coming out. The leading pipe interest has bought about 20,000 tons additional and is further negotiating. Some grades of old material have advanced.

Pig Iron

Sales and inquiries for iron in the eastern Pennsylvania districts continue more active and are bringing more cheerful expectations to producers. Consumers, apparently, no longer need to have their attention aroused by attractive price concessions and now are coming out voluntarily. An increased number of smaller consumers is in the market. The advance of $1 a ton to $13, furnace, posted by Buffalo makers, puts this iron at $15.45, Philadelphia, or above the schedules of eastern Pennsylvania producers. This development has added to the hopeful sentiment of eastern makers, as some Buffalo brands recently have been out-selling the furnaces in this territory.There is a good movement in low grade iron. The United States Cast Iron Pipe & Foundry Co. in the week made further liberal purchases for various plants, estimated at fully 20,000 tons or more of both northern and southern brands. For northern forge about $14, delivered this district, was done, and for southern forge, $10, Birmingham, was shaded. Fully 20,000 to 25,000 tons additional are under negotiation for this buyer and other pipe makers in this district. A Schuylkill valley rolling mill took 3,000 to 4,000 tons of standard forge at $14, delivered. Foundry sales in the Philadelphia district usually fall within the range of $14.75 to $15, delivered, for No. 2X, but in other nearby districts lower has been done. The J. L. Mott Iron Works, Trenton, took 1,500 tons of Nos. 1X and 2X for first quarter at about $14.35, delivered, and the National Radiator Co. in the same city bought 1,000 tons at about the same price. The Williamsport Radiator Co. took about 1,000 tons of first quarter No. 2X at $14.20, delivered. Many sales of 500 tons and less have been made. Virginia iron remains at $12.75, furnace, for No. 2X, though there are occasional reports that this is being shaded. The United States government asks about 1,500 tons of foundry iron for various eastern navy yards. Basic is quiet. One sale of 1,000 tons for a local buyer is reported. Recent sales of malleable, aggregating about 2,000 tons, have been taken in the district by Buffalo makers at approximately $15, delivered. Standard low phosphorus has sold 25 cents lower, or at $21.25, Philadelphia in transactions of several thousand tons. This grade is now quoted $21 to $21.50, Philadelphia. Lebanon low phosphorus is selling at $17.50, furnace. The reports for December of the Eastern Pig Iron Association showed a gain of about 30 per cent in orders and a smaller increase in stocks. In Virginia, orders fell away slightly and stocks showed a moderate rise.

Iron and Steel Bars

Makers of steel bars have been booking contracts more freely in this territory and also report better specifications. The contracts taken have usually been for first quarter and were done at 1.20c, delivered. One mill backed contracts aggregating 3,000 tons, and some of these were accompanied by specifications. The Chesapeake & Ohio railroad still is figuring on 1,500 to 3,000 tons for first quarter or first half. Some of the larger eastern makers of bar iron will not quote less than 1.25c, mill, but in some cases $2 less has been done by other producers.

Plates

Some of the eastern plate makers have been entering new tonnage in such better volume that they have instructed their representatives to quote present prices less freely and to take up such matters with the mill before action. The Lukens Iron & Steel Co. has increased its operations to about 70 per cent and reports new business, which is of a very miscellaneous character, is running at about this rate. The Lukens company will furnish 2,700 tons for a pipe line for the Southern Aluminum Co., Whitney, N. C., and 1,000 tons additional for the new plant of the latter is pending. About 6,000 tons of plates for the Brooklyn elevated railway section, upon which the Phoenix Bridge Co. is low, are expected to come to eastern mills. Some first quarter contracts are still being taken at 1.25c, Pittsburgh, or 1.40c, Philadelphia, but in some cases eastern producers are doing 1.20c, Pittsburgh.

Structural Shapes

Some improvement in new tonnage is now reported by eastern makers of shapes. Up to the past week this material has been moving sluggishly. Specifications are now appearing in heavier volume and contracting for first quarter is more active, one lot of 2,000 tons being noted. The prevailing schedule of prices is 1.20c, Pittsburgh, for first quarter and 1.25c, Pittsburgh, for second quarter, equivalent to 1.35c and 1.40c, Philadelphia, respectively.

Sheets

A fair movement of sheets is being maintained largely for quick shipment, as eastern producers are reluctant to sell very far ahead at present prices. The leading eastern producer this week is operating all of its seven mills at Conshohocken. Prices are very firm in the east on a minimum of 1.40c, Pittsburgh, for No. 10 gage blue annealed, and makers have not been obliged to shade this level.

Semi-Finished Steel

The Alan Wood Iron & Steel Co. started up this week its blooming mill at Dry Rock, which is running on stocked ingots as the steel works is still down. The blooming mill and steel works have been idle since Dec. 20. Billet business remains light. Prices are unchanged.

Old Materials

Some strengthening of prices in certain grades of scrap continues and the tone of the market is considerably improved. After having been down to $12.50, delivered, No. 1 railroad wrought iron is quoted at $13.50, delivered. Wrought pipe has sold at $9.50, delivered, or 50 cents higher. Turnings have advanced. Heavy melting steel still sells at $10, delivered, with transactions of the 500-ton class. December railroad lists brought about $10.25 for heavy steel, about $12.25 for heavy cast and over $13 for No. 1 railroad wrought, all delivered eastern Pennsylvania. Some of the steel went to Johnstown at $11.30 to $11.50, where some orders taken at $12.25, delivered, still are outstanding.

Portsmouth Company Buys Basic Pig

From a Southern Ohio Furnace—Leading Cast Iron Pipe Company Said to Have Taken a Larger Tonnage of Low Grades

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Jan. 13.

The Portsmouth Steel Co., Portsmouth, O., has closed for from 10,000 to 20,000 tons of basic iron for first half delivery, which will be furnished by a southern Ohio furnace. The price is generally thought to have been below $13, Ironton basis. The United States Cast Iron Pipe & Foundry Co. is rumored to have taken close to 50,000 tons of low grade iron from a large Birmingham producer the latter part of last week, at prices varying in accordance with the different grades, but all slightly below the basis of $11, Birmingham, for No. 2 foundry. The Lima Locomotive Corporation, Lima, O., has purchased from 1,500 to 2,000 tons of northern foundry iron and the Peerless Mfg. Co., Louisville, Ky., has taken 1,500 tons of southern foundry iron, both for first half delivery. Other sales include 1,500 tons of northern foundry iron to a Marion, Ind., melter, 500 tons of southern iron to a central Indiana user, and 600 tons of northern and 500 tons of southern foundry iron to a local consumer. The general inquiry is not as good as it was about a week ago, but it is better than at any time during the last quarter of 1913. Dealers report that they are figuring on numerous small inquiries ranging in size from 100 to 500 tons, and that a large proportion of these are being turned into sales.

Several dealers state that they will sell southern No. 2 foundry iron at $10.75, Birmingham basis, for either spot or first quarter delivery, and there is every reason to believe that $10.50, Birmingham, is being done occasionally. Iron to be had at this lower figure, though, is limited to special lots only from not more than one and perhaps two furnaces. The majority of makers in both Tennessee and Alabama are holding firmly at nothing less than $11, Birmingham basis, for No. 2 foundry for any delivery from the present time up until next July.

Coke

The market is very quiet and dealers report that they made but very few sales during the past week. Connellsville standard furnace coke for contract shipment is quoted at from $1.90 to $2 per ton, ovens, which is an advance of 10 cents a ton over last week's prices. This is attributed to the putting out of about 2,000 ovens in that district within the past few days in order to more nearly equalize production and consumption. Pocahontas producers are operating at about 50 per cent of their total capacities, as is also the case in the Wise county fields. In the New River district, about 500 ovens have been in operation for about a year with but very little change, as the production there, which is principally foundry coke, has been all contracted for in advance. Prices in the Wise county, Pocahontas and New districts are unchanged in comparison with those of last week, and are usually given as the same for both spot and contract shipment.

Finished Material

Warehouse prices on black and galvanized sheets No. 28 gage have been reduced 10 cents per 100 pounds following the reduction made by the local rolling mills last week. Black sheets, No. 28 gage, are now given at from 2.50c to 2.55c, and galvanized No. 28 gage at from 3.50c to 3.55c. Steel bars are unchanged at from 1.75c to 1.90c, and iron bars at from 1.70c to 1.80c. Plates and shapes are given at from 1.85c to 2c. Blue annealed sheets No. 10 gage have also been slightly reduced and are now quoted at from 2c to 2.10c. Warehouse business is a little better than it was last week, but it is being kept down because the mills are able to make quick deliveries, as they have a large stock on hand.

The local sheet mill reports fair specifications received during the past week and prices unchanged at from 2c to 2.05c for black sheets No. 28 gage, and from 3c to 3.05c on galvanized No. 28 gage, both f. o. b. Cincinnati and Newport, Ky.

Old Material

No. 1 machine cast and stove plate have increased a little in demand recently, the former because local foundries have begun to operate again and the latter because of the various uses that it can be put to. Stove plate is quoted at from $6.75 to $7.25 per net ton and No. 1 machine cast at from $9.50 to $10 per net ton. The other old materials show no change and the general report is that the market is very quiet and featureless. Prices continue to fluctuate in accordance with the conditions surrounding almost every individual sale.

Orders Ore Unloading Plant

The Pennsylvania railroad has closed contracts with the McMyler Interstate Co., of Bedford, O., for a fast ore-discharging plant to be installed at the Girard Point terminal, Philadelphia. The machine will be equipped with two grabs, capable of lifting 3 tons of ore each, which will enable an unloading rate of 100 tons per hour. It will be operated by steam. The plant is to be completed by April 1.

The American Engineering Co., Philadelphia, has purchased several properties near its plant at Cumberland and Aramingo streets, and it is reported that additions will be erected.

The Klingler Co., Pittsburgh, has been incorporated to manufacture cars by P. L. Klingler, J. A. McMillan, Pittsburgh; John A. McDowell, Bellevue.

Strong Demand for Southern Iron

Largest Tonnage in Months Sold in Birmingham District—Stocks Lower Than for Several Years

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Jan. 13.

Following the general buying awakening of the previous week, the condition of the local pig iron market continues to improve, and has given greater encouragement both to producers and consumers. With this improvement a strong demand for foundry grades has been brought out, and has resulted in the contracting of a tonnage greater than any week within the past four to six months. The presence of the larger buyers is very significant at this time, and some requirements of considerable tonnage are now pending which will very probably be entered. At the same time, nearly every class of trade was represented in the inquiry, and more especially the cast iron pipe and implement manufacturers. Some 22,200 tons were actually entered upon furnace order books during the week, while the aggregate of the tonnage pending is very much greater than this. The sales are about as follows: 1,800 tons of high manganese, low silicon iron for prompt delivery and deliveries over the first quarter, at a price ranging from $12.50 to $13, f. o. b. Birmingham, analysis governing; 6,400 tons of foundry grades in lots of 250 to 500 tons, also for immediate shipment, and some 14,000 tons in large quantities for delivery extending through the first quarter. All of this tonnage was entered at $11 to $11.50, No. 2 foundry basis, at Birmingham. With the strengthening of the market, fewer rumors of $10.50 and $10.75 per ton quotations are now being heard, and of the business transacted during the week there was not a reported sale at figures less than $11 per ton for No. 2 foundry at Birmingham.

While no official compilation of stocks on hand at the beginning of the year has been made, it is generally conceded that the warrant and furnace holdings are both less than they have been for several years. With the production of foundry iron at a minimum, and the increased demand prevailing, these conditions give the furnace interests of this district more confidence in the attainment of a better level of prices.

The Semet-Solvay Co. has completed its new retort coke ovens on the properties of the Central Iron & Coal Co. at Holt, Ala. With the completion of the new ovens, the capacity of the plant has been increased by about 50 per cent.

All of the machinery for the plant of the American Steel & Wire Co., at Fairfield, Ala., has been installed, and has also been thoroughly tested. The plant is now ready for operation and a large force is being assembled. Forty families have arrived within the week, while an equal number are expected to arrive during next week. The new plant is to begin operation as early as possible, and will mean the consumption of something like 500 tons of basic iron of the district per day.

Cast Iron Pipe

All of the plants scheduled to resume operation within the week have commenced work, and conditions are about normal again. The only transaction of any significance for the week is the reported sale of 12,000 tons of pipe for the requirements at Portland, Ore., with an additional tonnage of some 9,000 to 10,000 tons of fittings and other castings. A small tonnage of extensions and repairs was also reported as sold, which was immediately delivered from stock. The forwardings have not yet become normal, however. This is to be expected just after the holiday close-down. The proposed erection of a new plant within the district is being persistently rumored, and is more generally credited.

Old Material

The scrap market experienced a better week than for some time. It seems to have responded to the increase in demand for pig iron, and as a result a better feeling prevails among the dealers. Greater activity characterized the week, and several sales were made. Movements of contract tonnages and bargain lots are still in order. While the volume of business transacted during the week showed an attractive increase over several weeks previous, the condition of the market is far below normal and very unsatisfactory.

Wages Reduced.—The Clinton Iron & Steel Co., Pittsburgh, readjusted wages slightly last week, affecting about 40 per cent of the men employed at the blast furnace plant. Men formerly receiving $2.50 or more a day were reduced about 10 cents a day, and are now receiving the same wage effective at the blast furnace plant some time ago. Day laborers were not affected by the readjustment.

LIMITED BUYING

In St. Louis Territory—Quotations on Scrap Advance.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, Jan. 13.

The sudden buying movement that started in pig iron in the St. Louis territory last week, resulting in a number of transactions, seems to have subsided, but local sales agents are by no means discouraged. A new inquiry made its appearance today for 2,000 tons of Southern No. 2 for delivery over the first half of the year. The inquiries for 1,000 tons of southern No. 2 and 300 tons of northern reported last week, have not been closed, and the Burlington (Ia.) concerns that asked for 600 tons of northern and 700 tons of southern iron are still reported to be in the market. Most of the local sales agents are holding for $11, Birmingham basis, but there is abundant evidence that iron could be bought at $10.75. Northern iron is held at $14 to $14.50, Chicago, and $13.50 to $14, Ironton.

Connellsville 72-hour foundry coke is quoted at $2.65 to $2.75, for immediate delivery, and $2.75 on contract. Business is at a standstill.

An advance in scrap prices has taken place, and dealers are confident some good business will result. All of the steel mills are urgently asking for prices on steel.

Wire Making in Moving Pictures

At the meeting of the Cleveland Traffic Club, held at the Hollenden, Cleveland, Monday evening, Jan. 12, the moving pictures of the American Steel & Wire Co., showing the manufacture of wire products beginning with iron ore and going through all the processes, were shown to a highly appreciative audience of about 200. The pictures were explained in a very entertaining manner by J. W. Meaker Jr., Chicago, manager of the fence department of the company. Music was furnished by the Ionic quartette.

W. S. Pilling, of Pilling & Crane, Philadelphia, is enjoying several weeks in Florida.

Optimism Prevails in Cleveland Market

Increased Activity Maintained—Heavy Tonnage of Wire Products Booked—Mills Follow Conservative Policy

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, Jan. 13.

A distinctly optimistic feeling continues to prevail in the iron market. The feeling is that if reasonable activity becomes established without much aid from the railroads, a decision favorable to the railroads on the rate question would assure prosperity for the remainder of the year. Judging, however, from the immense amount of information which the Interstate Commerce Commission is requiring the railroads to compile, a number of months will be required to digest all the facts. Cleveland railroad offices worked not only Saturday afternoon, but Sunday, in compiling reports as to contracts for materials, including prices, in response to directions from the commission.

Iron Ore

Nothing will be done for several weeks, at least, towards establishing the ore market for 1914. Furnace interests are making no inquiry and both ore shippers and vessel owners are inclined to let the whole subject alone for a while. In fact, many of them are intending to take their usual vacations immediately after the annual meeting of the Lake Carriers' Association, which convenes in Detroit next week. In all probability, it will be March before the subject is given consideration. Vessel interests are naturally desirous of a late start, as a late opening always lends strength to the summer and fall markets. No predictions are ventured as to the ore movement for 1914. The natural thing to say at present is that it will be less than that of 1913, but really nobody can tell.

Pig Iron

The heavy buying reported last week has been followed by very active inquiry and the placing of a large number of comparatively small tonnages. The appearance in the market of a large number of melters whose individual tonnages are not heavy is regarded as fully as favorable as the buying by some larger interests a week ago. Corrigan, McKinney & Co. stated that they did not take any of the basic which was bought by the Andrews Steel Co., and it is now generally believed that all of this tonnage went to southern furnaces. The Cleveland Furnace Co. blew out one stack last Saturday. The Central plant of the American Steel & Wire Co. now has all of its stacks in blast except one which has been out for repairs since last September.

Coke

Coke prices are firm. At present, there is not much activity. Foundries are pretty well covered and furnaces which have not already contracted are not anxious to do so at $2.

Finished Materials

The increased activity reported last week has continued and mills are somewhat firmer in their views as to prices. A conservative policy in making contracts is being followed by the mills. This is particularly true in regard to structural material, for which there has been a decided increase in inquiry. Some structural shops, however, are anxious to take on more business, and one which depends to a large extent on railroads will close its plant unless some new business develops soon. On steel bars, contracts are made until July 1, and 1.20c, Pittsburgh, is apparently the minimum, while for delivery after the first quarter, higher prices prevail. Following the withdrawal of quotations by the American Steel & Wire Co. and the naming of a base of 1.55c on wire nails, the company took on a very large tonnage of contracts, on which jobbers were restricted to 60 days. Most of the largest buyers of wire products are now covered by contracts on wire products. On sheets, the demand has caused some makers to refuse to make the minimum quotations, but those quotations are still named by some mills.

Old Material

Business has been rather quiet during the past week, although almost up to the normal volume of this time of year. Inquiries are said to be numerous, but there has been comparatively little mill buying. The recent cold snap has stiffened prices a little. Heavy melting steel is quoted $9.50 to $10, as compared with $9.50 to $9.75 last week. Dealers are more optimistic as to an upturn in prices, and as the majority are holding for an advance, little scrap can be secured at the prices which ruled a week or so ago.

English Buyers Overstay the Market

And Are Hurrying to Have Orders Entered—Decided Upward Movement is Expected—Hardening of Some Prices

BY J. HORTON

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 3.

Pig iron has suffered a little from the interruption of consumption during the Christmas holidays, and this has probably accounted for some quietude and relaxation of prices reported from Cleveland. The general belief is that a decided upward movement may now be looked for. From Sheffield comes the news that difficulties have already arisen through the scarcity of the better classes of pig iron, which has actually impeded production at some of the works. Consumers are now beginning to realize that they have waited a little too long, and they are displaying some hurry to get their orders attended to. At the Birmingham meeting on New Year's Day, a very marked feature was the anxiety of buyers of raw material to get their contracts accepted. A good deal of informal negotiation is in progress, but smelters are in a better position than they were a month ago, in the matter of orders. They are still more determined to obtain higher prices, owing to a substantial rise in the price of coke. The quotation has been lifted 1s during the past week, and there is every sign that smelters have to look forward to another period of dear coke. They are entirely indisposed to accept large forward orders, and buyers who succeed in placing these will have to pay a premium. There is every indication in the Cleveland market of brisk business over the first quarter of the year. The reduction of stocks for the month of December is 9,000 tons, in spite of the Christmas accumulation. No

doubt, a certain amount has collected in makers' hands. The shipments for the month were 82,000 tons. The output has been reduced a little in Cleveland by the blowing out of a furnace at Weardale, while at Consett, a disastrous explosion, resulting in the loss of two lives, has put another furnace out of action. There has been a decided increase in hematite values during the past few weeks, and especially in the Barrow district. It is known that steel makers will require large quantities of raw material very early in the new year. All the production is going into consumption, and the total stock in that district amounts to only 9,000 tons. The Cleveland quotation is 50s ($12.24) cash, with 50s 9d ($12.42), three months. East coast hematite, which is largely used in Sheffield, is being sold there at 66s 3d ($16.22), delivered. The tolerable certainty of heavy consumption of material, when business really recommences, is imparting a good tone to the pig iron market. In the Birmingham district, inquiries with a view to Quarter day, next week, have been very numerous, and a large proportion of them are tolerably certain to lead to business.

Finished Iron and Steel

The re-opening of the Birmingham market on New Year's Day, after a fortnight's holiday, gave a very good indication of the iron and steel position. Consumers now appear to have decided that the time has arrived to buy, and that those who wait longer will fare worse. One large merchant, the other day, placed orders for 1,500 tons of iron, largely for warehousing, with several Black Country mills. Material additions to order books have been quite the rule during the holiday, and there is every sign of a busy quarterly meeting next week.

It is a little remarkable that the signs of improvement should have coincided with a fall of 10s ($2.04) in the price of marked bars. This brings the selling figure for best iron to £8 10s ($41.62), with the usual 12s 6d ($3.06) extra for the Earl of Dudley's brand. The reduction is not at all a sign of depression, but rather of some willingness to get business. The cut is some weeks overdue, because the proper relation between marked and unmarked iron is a difference of about £1 10s ($7.34). Yet for several weeks, unmarked iron could be bought at £6 17s 6d ($33.66) to £7 ($34.28), while marked iron has stood at £9 ($44.08).

The urgent necessity to re-stock warehouses will itself suffice to keep the mills employed for some little time. The Christmas holidays extended in some cases over a full fortnight, but there will be hardly any mills idle next week. Finished iron prices generally, apart from marked bars, are at recent figures, but an exception is galvanized sheets, now universally quoted at a minimum of £11 5s ($55). Some firms are asking £11 10s ($56.32), and occasionally some higher premiums are demanded for lengthy orders.

CHICAGO FOUNDRYMEN

Begin Making Arrangements for the Convention of Next September.

A preliminary meeting of the Chicago foundrymen to make arrangements for the 1914 convention of the allied foundry associations was held at the La Salle hotel, Chicago, Jan. 12. A temporary local organization was perfected of which Charles B. Carter, of the American Brake Shoe & Foundry Co., is chairman and Oliver J. Abell, of *The Iron Age*, secretary. Permanent local committees will be organized at an early date. The convention arrangements this year will be somewhat different from those of last year owing to the fact that the funds for the entertainments have already been provided and the Chicago foundrymen will not be called upon to contribute any large sums.

Some of the details of the entertainment program have been tentatively arranged. It is expected that there will be a banquet Monday evening, Sept. 7, at the Fort Dearborn hotel, at which members of the Associated Foundry Foremen will be entertained. The annual subscription dinner will take place at the La Salle hotel Thursday evening, Sept. 10. One evening during the week will be given over to a visit to White City, one of Chicago's most prominent amusement parks. All of the attractions of the park will be thrown open to the visiting foundrymen.

Safety Council.—The first monthly conference of the Chicago local council of the National Council for Industrial Safety will be held at the City Club, Chicago, Friday evening, Jan. 16. An interesting program has been provided, including motion pictures showing safety devices in machine shops. Among the speakers will be B. C. Christy, of the International Harvester Co.; R. C. Richards, of the Chicago & North Western Ry. Co.; Henry Koester, of the National Galvanizing Co., and J. C. Smith, of the Inland Steel Co.

BUFFALO PRICES HIGHER

Following Recent Heavy Buying of Pig Iron.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Jan. 13.

The sales of pig iron of the week amounted to over 30,000 tons of all grades, ending the bottom price buying that resulted in the booking of 40,000 tons last week and a total of fully 100,000 in the past five weeks. The volume of orders since the first of the year is considered unusual in the district for this season when activity is usually very light. The bulk of the iron sold was for first quarter delivery and only in exceptional cases were tonnages placed at the prices that have prevailed for delivery beyond first quarter or up to the close of the first half of the year. Where sold beyond April 1 it has been at an advanced price. Iron below $13 is out of the market except gray forge, which is quoted at this time from 25 to 50 cents below that figure. The producers say that foundries that have not contracted or taken up options on iron at the schedule which prevailed a week ago, have passed the chance to book their requirements at those figures and must now pay the advance. No. 1 foundry is now being quoted at $13.25 to $13.50 by the different interests in the territory.

Finished Materials

A decided improvement in sales, inquiry and sentiment is reported by every one of the mills and agencies of the territory. Buyers are coming in for practically all classes of material and while no particularly large tonnages have been placed, the aggregate amounts to considerable. Consumers that have been out of the market for some time are now coming back with inquiries and orders. This change has occasioned a firming of prices. The mills are quoting 1.20c, base, on bars for immediate specification and 1.25c, base, for first quarter delivery. Some tonnages at the latter price have been placed under pressure with one of the interests for second quarter, but the general attitude of all the mills is to confine sales to first quarter requirements. Structural steel is now firm at 1.25c, base, and plates have been placed by some at 1.20c for favorable specifications, while the prevailing quotation is 1.25c. Earlier quotations by some of the producers have been withdrawn.

There is also an improvement noted in the wire market. Nails have ad-

vanced $1 a ton and the previous quotation of 1.50c has been withdrawn and orders are now being taken at 1.55c, base, but for early delivery only. Chain has advanced $2. Three-eighths proof coil is quoted at 3 cents. Cold rolled has developed better trading, resulting in the schedule changing to 65 per cent off.

The fabricators say that while the present booking and work on hand is moderate, because of the season of the year, a decided improvement in feeling is noted and they anticipate the development of a considerable volume of business as spring approaches.

Old Materials

Prices have advanced on eight classes of scrap within the past week. All of the dealers report improved activity general in character. There is a considerable demand for heavy melting steel at an advance of 25c per ton over the quotation of a week ago. Car wheels at less than $11 are out of the market. The price is now $11 to $11.50, and the movement of this commodity at the advanced prices quoted, in the past week, amounted to over 300 tons. The lines advanced include heavy melting steel, bundled sheet scrap, No. 1 busheling scrap, old car wheels, machine shop turnings, heavy steel axle turnings, cast borings and bundled tin scrap.

There is no disposition on the part of the yards to accept orders for large tonnages. The amount of sales is being held down in anticipation of a further stiffening of the market.

METAL MARKETS

Chicago

Jan. 12.

New Metals.—The copper market has suffered a relapse and prices are unsettled. Spelter and lead are fairly firm but tin is weaker. Buying is restricted.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 15c; casting, 14¾c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.15c; lead, desilverized, 4.10c; sheet zinc, $7.50, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 38c; Cookson's antimony, 7½c; other grades, 6½c.

Old Metals.—Inquiry from brass foundries is better and fair sales have been made recently; otherwise the old metal market is in a suspended condition and dealers are not sufficiently confident of the future to become active purchasers.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13½c; copper bottoms, 11¾c; heavy red brass, 11¾c; heavy yellow brass, 8c; No. 1 red brass borings, 10½c; No. 1 yellow brass borings, 7½c; brass clippings, 9c; lead pipe, 4c; zinc scrap, 3¾c; tea lead, 3½c; No. 1 aluminum, 12½c; No. 1 pewter, 25½c; block tin pipe, 33½c; tin foil, 28½c; linotype dross, 3c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3c.

WANTS TO KNOW

Whether Steel Corporation Has Received Rebates in Six Years.

Washington, Jan. 13.—The senate committee on interstate commerce, of which Senator Newlands is chairman, will sift the proper procedure to follow in connection with a resolution offered by Senator Lane asking that an investigation be conducted to ascertain whether the United States Steel Corporation has within the past six years accepted rebates or other preferences from railroads.

Senator Newlands opened a discussion, lasting an hour and a half, as to the proper procedure, and made a motion that the resolution be referred to the interstate commerce committee to sift the matter as to the form of the resolution and determine what department should conduct the inquiry.

Senator Root expressed the opinion that it was a question whether one house of congress alone had the right to give orders to the Interstate Commerce Commission for such an inquiry, and he said he thought a concurrent resolution to be passed by both houses should be adopted that no conflict might result. Senator Borah upheld the original form of the resolution.

"I have no doubt," said he, "that if the resolution passes, the Interstate Commerce Commission would make an investigation and ascertain some very interesting facts. Just at this time it is important that this information be obtained and I favor the resolution as it stands."

Senator Cummins objected to the inquiry being made by the commission on the ground that it is already overburdened with work. It was his belief that the department of justice or some other body should make the investigation. Several other senators took the view that the resolution called for amendment to determine the proper form it should assume. The vote in favor of Senator Newlands' motion to refer the resolution to the interstate commerce committee was carried by a vote of 32 to 26.

Senator Lane's resolution directs the Interstate Commerce Commission to conduct an inquiry to ascertain if evidence exists justifying the government in instituting suits for the recovery of fines from the United States Steel Corporation, its subsidiaries, or any common carrier because of "unlawful rebates, offsets, and preferences" accepted by the Corporation or its constituent companies within the last six years. It is proposed that public hearings be held before one or more members of the Commission and that it subpoena William H. Green, Creighton, Neb., and any other persons who may give material evidence. Senator Lane said Mr. Green was a witness in the International Harvester Co. suit and possessed knowledge of rebates granted the Steel Corporation by railroads.

WITH FULL FORCE

Motor Car Company Resumes—Activity of Wisconsin Plants.

Milwaukee, Wis., Jan. 13.—The Westinghouse Lamp Co., of New York, subsidiary of the Westinghouse Electric & Mfg. Co., is seeking a location in Milwaukee for a general western lamp manufacturing plant to employ from 3,500 to 5,000 workmen. Negotiations are pending for the lease of the former Romadka trunk works, covering two square blocks at Thirty-first and Center streets, and now occupied under lease by the Kissel Motor Car Co., of Hartford, as a branch factory. If the Westinghouse interests succeed in leasing the Kissel shops, the Hartford concern intends to build a plant in Milwaukee, of considerably larger size than the Romadka works.

The Kissel Motor Car Co.'s main works at Hartford, Wis., have resumed the annual run with a full complement of men, after a shut-down of two weeks. The usual mid-summer vacation was omitted in 1913 because of the rush of business, and inventory and overhauling was carried on during the last two weeks of the year. The company intends to operate continuously throughout the present year. It also has a large plant at Milwaukee, which operates on the same schedule as the main works in Hartford.

The large works of the J. I. Case Threshing Machine Co., at Racine, will on Feb. 1 operate ten hours a day with a full force of workmen, numbering 4,700 men. During the last two months of 1913, the company operated eight hours a day for 5½ days per week. It has now not only put on a full shift in the old works, but is rapidly manning the new south for occupancy at a cost of $1,250,000.

The Pierce, Butler & Pierce Mfg. Co., Norwich, N. Y., a $5,000,000 hardware corporation, was placed in the hands of a federal receiver on Jan. 10, upon petition. Assets were placed at $3,291,242 and liabilities at $1,902,352. The business was founded in 1839 by Sylvester E. Pierce, father of Wm. K Pierce, who recently withdrew as president of the concern.

QUIET IN DETROIT

With Hope of More Activity—Shipbuilders Looking for Busy Season.

Detroit, Jan. 14.—The iron and steel market in Detroit is a state of tranquility. While producers, builders and buyers in general are not discouraged over conditions, there seems to be a tendency to hold off to "see what the other fellow is going to do." The copper, zinc and other metal markets are ranging along with the iron and steel. The general impression in Detroit is that the settlement of the currency legislation will have much to do with improving business.

Copper and brass rolling mills are doing a steady, though not exciting, business, but they are preparing for a better trade later on. Contracts have been let for a number of large buildings in the downtown district, and one building in particular, the Statler hotel, will take 5,500 tons of structural iron.

No changes have been reported in prices in the scrap market during the past week and one of the larger houses in the western part of the city reports receipts as being somewhat smaller than they were at this time in 1913. There has been some improvement in the sentiment over the preceding week.

The Jennison Hardware Co., of Bay City, will erect a modern warehouse in the spring. The building will be two stories and will be constructed of steel, re-inforced concrete and brick. The new structure will cost approximately $40,000.

The Aultman & Taylor Machinery Co., of Mansfield, O., and Lansing, Mich., has filed articles of incorporation with a capital of $1,000,000. The Rogers-Schmidt Wire & Iron Co., of St. Louis, Mo., and Bear Lake, Mich., has also incorporated with a capital of $10,000.

Detroit, judging by the latest reports of the telephone company has a population of 584,000 and with its suburbs the total is 641,885. The telephone company is preparing for 1,000,000 people in 1930.

Safety First Calendar.—The casualty department of the American Sheet & Tin Plate Co., Pittsburgh, has issued a "safety first" calendar to its employes, about 26,000 being required. Each month has something suggestive and helpful in regard to the safety movement, as, for instance, for January the lines printed in red ink are: "Make this a New Year's resolution, to keep in mind safety always and thus prevent accidents to yourself and fellow workers." In February this inquiry is made: "Does the wife or mother realize that a parting word of caution to a loved one would be a most effective means of promoting safety?" On the July page these words are printed: "It is better to be safe a thousand times than to be crippled once."

MORE EMPLOYMENT

For Molders in the New York-Jersey Foundry District.

New York, Jan. 13.—Some improvement is noted in the schedule of foundry operations in this district. A good many plants which have been shut down in whole or in part for several weeks past are now ordering their men back to work. The Fagan Iron Works, Hoboken, has resumed operations on a schedule of four days per week. The John Hewitt Foundry Co., East Newark, has started up with a few men. The Barlow Foundry Co., Newark, put its full force back to work yesterday. The Otis Elevator Co., Harrison, resumed work yesterday on a four-day per week schedule, and the foundry of the Snead & Co. Iron Works is again in operation. The Brooklyn navy yard steel foundry is shut down, but the iron foundry is operating on full schedule. The Hudson Foundry Co. and the Gibson Iron Works, Jersey City, are busy, and Edward Maher's Sons Co., Newark, resumed yesterday with about one-quarter its usual force. The Louis Sacks Iron Foundry and the Riverside Steel Casting Co., Newark, are operating on the usual schedule. The Thatcher Furnace Co., Newark, resumed operations yesterday. The Oscar Barnett Foundry Co., Irvington, can use more molders and has a lot of work on hand. The Alexander Traud Co., Newark, is also operating to capacity. The Maher & Flockhart Foundry, Newark, the largest foundry in that section, has resumed after a shutdown over a few days. Altogether, the foundry industry in Newark and vicinity is operating at about 50 to 60 per cent of capacity.

The Navasota Light & Power Co., Navasota, Tex., has increased its capital stock from $20,000 to $200,000 and changed its name to the Navasota Ice, Light, Power & Water Co. Extensive improvements and additions will be made to its light, power and waterworks plants.

The Turbo Co. has been incorporated at Perth Amboy, N. J., to deal in and manufacture flying machines. Incorporators are: William H. Considine, Geo. W. Ryan, A. W. H. Griepe, New York.

GREATEST DECREASE

In Bar Iron Prices in Ten Years Reduces Wages of Puddlers.

Pittsburgh, Jan. 13.—The average realized price on bar iron sold by selected mills in November and December of 1913 was 1.2030c, it developed at the bi-monthly settlement between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers, held Jan. 10 at Youngstown, O. Puddlers will receive $5.85 a ton for boiling during January and February. At the preceding conference, Nov. 11, it developed that the average realized price on bar iron had dropped from 1.5029c for July and August, to 1.3931c for September and October, resulting in a decrease in the boiling rate from $7 to $6.50 a ton, or 60 cents.

The average realized price on bar iron, sold by selected mills, in 1913 was 1.4421c, or $0.1776 above the average established in 1912, and $0.1823 above that for 1911. The average established in 1910 was a fractional higher than that for the year just ended.

The decrease in the average price of bar iron for November and December was the greatest recorded in 10 years. Bi-monthly settlements in 1912 and 1913 and yearly averages since 1906 follow:

Bi-Monthly Settlements.

	1913.	1912.
Jan.-Feb.	1.4831c	1.187c
Mar.-Apr.	1.5434c	1.195c
May-June	1.5272c	1.2183c
July-Aug.	1.5029c	1.2518c
Sept.-Oct.	1.3931c	1.3351c
Nov.-Dec.	1.2030c	1.40c
Year's ave.	1.4421c	1.2645c

Annual Average of Settlements.

For year 1912	1.2645c
For year 1911	1.2598c
For year 1910	1.4423c
For year 1909	1.360c
For year 1908	1.386c
For year 1907	1.627c
For year 1906	1.587c

Will Employ More Men

The Royal Typewriter Co. has decided to take on 200 more hands at its plant at Hartford, Conn. The company on Jan. 1 increased its capital from $3,000,000 to $8,000,000. It has placed orders for a large quantity of new machinery and contemplates a considerable increase in its output.

The Hopkins Machine Works, Bridgeton, R. I., which has been shut down for more than a year, has been leased by the Hopkins family to Edwin J. Potter, of Bridgeton, and the latter will soon put the plant in operation.

MORE MEMBERS

Will be Added by Institute—75 Applications Approved.

Action to increase the membership limit of the American Iron and Steel Institute from 1,000 to 1,500 was taken at the regular meeting of the directors of the organization, held at New York City, Jan. 9. This increase was provided for by the adoption of an amendment to the by-laws raising the active membership from 1,000 to 1,250 and by the creation of an associate membership to be limited to 250. To establish the associate membership, an amendment of the constitution was adopted by the directors, which is subject to ratification by the general organization. A call has gone forward for a general meeting, at which this ratification is expected to be given. This meeting will be by proxy.

After having taken the required steps to enlarge the membership, the directors proceeded to add 75 new names to the active list and also passed upon 50 additional names for associate members, the latter to await for formal admission until the constitutional amendment is ratified.

The dates of May 22 and 23 were fixed upon for the annual New York meeting. The general committee on arrangements appointed consists of six resident directors and is composed of the following: James A. Farrell, chairman; E. A. S. Clarke, John A. Topping, Charles M. Schwab, F. S. Witherbee and J. C. Maben.

The members admitted are as follows:

Godfrey D. Baackes, Chicago, assistant department manager, American Steel & Wire Co.; Oliver B. Barrows, St. Louis, sales agent, American Steel & Wire Co.; Robert E. Belknap, Chicago, sales agent, Pennsylvania Steel Co.; Edward G. Black, Chicago, Edgar Allen American Manganese Steel Co.; Herbert F. Black, Pittsburgh, Cambria Steel Co.; Donald S. Boynton, Chicago, Pickands, Brown & Co.; James Burry, M. D., Chicago, chief surgeon, Illinois Steel Co.

Thomas W. Campbell, Indiana Harbor, Ind., roll designer, Inland Steel Co.; George H. Charles, Middletown, O., American Rolling Mill Co.; Herbert G. Clopper, New York City, New Jersey Zinc Co.; Cloud C. Conkling, Lackawanna, N. Y., Lackawanna Steel Co.; Donald E. Cotton, St. Paul, Illinois Steel Co.; L. W. Crane, Chicago, Republic Iron & Steel Co.; Harry DePuy Cushman, Cleveland, American Rolling Mill Co.

Fred C. Deming, Buffalo, Carnegie Steel Co.; A. H. Dillon, Youngstown, O., Youngstown Sheet & Tube Co.; Paul W. Dillon, Sterling, Ill., Northwestern Barb Wire Co.; Harry S. Doyle, Chicago, American Steel & Wire Co.

Walter C. Ely, Terre Haute, Ind., Highland Iron & Steel Co.

William P. Gleason, Gary, Ind., Indiana Steel Co.; Robert Gregg, Atlanta, Ga., Atlanta Steel Co.

George W. Hamilton, Milwaukee, Illinois Steel Co.; L. C. B. Holmboe, So. Chicago, Ill., Illinois Steel Co.; George C. Holmes, St. Louis, Lackawanna Steel Co.; Clarence H. Howard, St. Louis, Commonwealth Steel Co.; Frank P. Howe, Philadelphia; William H. Hughes, Philadelphia, Hughes & Patterson; Elton B. Hull, Toledo, O., Toledo Furnace Co.

Edward L. Ives, Chicago, Iroquois Iron Co.

Percy R. Jackson, Cleveland, The Otis Steel Co.

John W. Kagarise, Braddock, Pa., Carnegie Steel Co.

Frank E. Leahy, McKeesport, Pa., National Tube Co.; Leif Lee, Youngstown, O., Youngstown Sheet & Tube Co.; S. L. Leonard, Detroit, American Car & Foundry Co.; Charles E. Lozier, Elyria, O., vice president, Columbia Steel Co.; L. C. Lustenberger, Pittsburgh, Carnegie Steel Co.

Harry E. McDonnell, Milwaukee, Wis., Illinois Steel Co.; David S. Mathias, South Chicago, Ill., Illinois Steel Co.; W. H. Merriam, Duluth, Oliver Iron Mining Co.; Benjamin F. Mohr, Chicago, Illinois Steel Co.; H. Morrison, Chicago, Illinois Steel Co.; Wm. M. Myers, Terre Haute, Ind., Highland Iron & Steel Co.

Chester A. Orr, Cleveland, American Steel & Wire Co.

Frank L. Pinkham, Pittsburgh, National Tube Co.

Henry S. Raymond, Chicago, manager sales, National Tube Co.; James P. Roe, Pottstown, Pa., Glasgow Iron Co.; George E. Rose, Chicago, Wisconsin Steel Co.

Harry E. Sheldon, Pittsburgh, Allegheny Steel Co.; Franklin E. Slagel, Buffalo, Lackawanna Steel Co.; Edw. M. Sparhawk, Denver, Carnegie Steel Co.; Arthur W. Sprague, Chicago, American Steel & Wire Co.; Frederick W. Sykes, Chicago, American Steel & Wire Co.

Elmer W. Thomas, Joliet, Ill., Illinois Steel Co.; J. Fred Townsend, Pittsburgh, National Tube Co.

B. W. Vallat, Ironwood, Mich., Newport Mining Co.

James G. West Jr., South Chicago, Ill., Illinois Steel Co.; Montgomery Whaling, Detroit, American Steel & Wire Co.

D. L. Braine, New York City, Composite Tin Plate Co.; Ralph H. Sweetser, Easton, Pa., president, Thomas Iron Co.; Benjamin Affleck, Chicago, Universal Portland Cement Co.; James W. Bramard, Pittsburgh, Carnegie Steel Co.; Harold C. Jones, Chicago Heights, Ill., Inland Steel Co.; Morris Metcalf, Chicago, Universal Portland Cement Co.; Samuel J. Reeves, Philadelphia, Phoenix Iron Co.; Chas. A. Stillman, Chicago, Iroquois Iron Co.; Chester D. Tripp, Chicago, Rogers-Brown Ore Co.; Leonard Wesson, Chicago, Universal Portland Cement Co.; George C. Lowell, Gary, Ind., Indiana Steel Co.; Frederick Lovejoy, New York City, West Pennsylvania Steel Co.; John B. Clark, Donora, Pa., American Steel & Wire Co.; C. D. S. Miller, Bridgeport, Conn., president, American Tube & Stamping Co.; James W. Porch, New Orleans, Lukens Iron & Steel Co.; Joseph A. Rees, Chicago, vice president, Empire Iron & Steel Co.; Dez C. Schonthal, Huntington, W. Va., West Virginia Rail Co.; Frank F. Slick, Braddock, Pa., Carnegie Steel Co.; John E. Woods, Cincinnati, Carnegie Steel Co.

Would Improve Conditions

The Newark Foundrymen's Association, Newark, N. J., held a meeting on Jan. 7 for the purpose of considering the New Jersey state laws relative to foundries, mills, etc., as embodied in the pamphlet issued by the state department of labor in 1912. The foundrymen at the meeting expressed themselves as being desirous of conforming to the law as far as possible, and were of the opinion that there were very few of the provisions that were not already cared for by the foundries. At the same time, it was felt that some of the provisions of the law, as set forth in the pamphlet, were impossible of direct application. State Commissioner of Labor Col. Lewis T. Bryant and Inspector Roach were present. The commissioner stated that he would endeavor to be fair in enforcing the law, and that it was his intention to get after plants where conditions of ordinary decency and regard for health and safety were ignored.

SLOWILY INCREASING

Are Mill Operations in the East—Plate Plants Doing Better.

Philadelphia, Jan. 12.—With some exceptions, the increased tonnage of pig iron and finished steel that has appeared before eastern Pennsylvania iron and steel makers in the past ten days or so, has not had the effect, as yet, of producing much gain in operations, over the scale prevailing before the Christmas shutdowns.

Here and there, plants which have been allowed to run at a low point in recent weeks have been speeded up somewhat, but generally, the improvement in volume has not been extensive enough, at least, on orders for early delivery, to cause the necessity for much greater tonnage.

The Lukens Iron & Steel Co., Coatesville, has been increasing its production somewhat and now is operating at 70 per cent of capacity. Other eastern plate makers are also doing a little better. The Alan Wood Iron & Steel Co., which last week started up six of its seven sheet mills at Conshohocken after two weeks' idleness, this week has increased its operations to include the full capacity of seven mills. The company this week also is starting the blooming mill of its steel works at Ivy Rock, which has been down since Dec. 20, but the open-hearth plant still is idle, as a considerable tonnage of ingots is in stock. The one active blast furnace of the company at Swedeland, after having piled considerable iron, is being blown out.

Owing to the lightness of rail demand, the operating capacity of the Maryland Steel Co. at Sparrows Point continues to be curtailed. Activities of the Pennsylvania Steel Co. at Steelton are upon about the same level as when operations were resumed after the holidays, though bookings by the company this month are better. Eastern shape mills, including the Eastern Steel Co., the Phoenix Iron Works, and the Bethlehem Steel Co., which have been running around 50 per cent of capacity, are unchanged. This week, however, these companies have noted some increase in their tonnage and look for better conditions.

Among the eastern merchant furnaces, a gain of one stack is shown by the blowing in within the week of the No. 1 Crane stack at Catasauqua. The large Warwick furnace at Pottstown may resume soon, as its relining practically has been completed. No definite date for its resumption has been fixed.

The Kelley Motor Co., Springfield, O., has reduced its capital stock from $500,000 to $5,000.

PAYS BILLS NOW

But Was Slow Before Being Absorbed —Testimony in Corporation Suit.

Birmingham, Ala., Jan. 13.—Hearings in the dissolution suit of the government against the United States Steel Corporation were adjourned after the session here yesterday and were to resume today in New Orleans.

The principal witness heard yesterday was George W. Conners, president of the Conners-Weyman Steel Co., Birmingham. He gave it as his opinion that the separation of the Tennessee Coal, Iron & Railroad Co. from the Steel Corporation would be a misfortune for the south and the whole country. He said the property of the company had been greatly improved and that the Tennessee company had met its bills more promptly since it had come into the possession of the Steel Corporation.

He said he organized the Conners-Weyman Steel Co., which makes steel hoops and cotton ties. His company buys about 5,000 tons of steel billets annually and in buying bids are received from a dozen companies, bids always varying. In 1903 and 1904, he heard rumors of a combination among steel billet makers, but his business was not affected and he obtained competitive bids at all times.

Products of his mills are sold in all the southern states, where cotton is produced. At no time, said Mr. Conners, had he found the Steel Corporation engaged in underhand methods.

He testified he had been a creditor of the Tennessee company for years and it never met its bills promptly until taken over by the Steel Corporation.

Walker L. Williford, Memphis, secretary and treasurer of the Chickasaw Cooperage Co., testified his firm buys steel on a competitive basis and buys 25,000 to 45,000 tons a year. Most of his company's requirements are taken by the Sharon Steel Hoop Co., merely as a matter of friendship and sentiment. He gave it as his understanding that independent companies handle over 60 per cent of the steel hoop business. He also testified that he had been informed there is no money in the manufacture of cotton ties.

(Report of last week's hearings will be found on page 189 of this issue.)

Magnetic Separators. — Removing iron particles from ground scrap rubber in the reclamation plant of a rubber mill and extracting the metallic iron from crushed slag in the steel plant are two new applications of Cutler-Hammer magnetic separators that have recently been made. The separating is effected by simply passing the ground or crushed material on a belt over the magnetized pulley, which picks out the metallic particles and allows the remainder to be cast forward to a conveyor or chute.

WAGES REDUCED

By Alan Wood Company, Which Restores Level Before 1913 Advance.

A reduction of 10 per cent in the wages of tonnage men and slightly less in common labor, has been posted by the Alan Wood Iron & Steel Co., to take effect at its Ivy Rock, Pa., and Conshohocken, Pa., plants, Jan. 26. This reduction will restore the wages to the level that existed March 1, 1913, when the demand of the men for an advance of 10 per cent was granted. The J. Wood Co., Conshohocken, Pa., manufacturer of iron plates and sheets, has announced a similar reduction.

The Alan Wood Iron & Steel Co. shut down its steel works and blooming mill at Ivy Rock and its finishing mills, on Dec. 20. The sheet mills resumed Jan. 5, and are now running full. The blooming mill is resuming this week to work up steel from stock and the steel works remain idle. The company is blowing out its one operating furnace as it has piled a considerable tonnage of basic iron.

The Burden Iron Works, Troy, N. Y., also recently put in effect a reduction in wages.

Ready for American Can Suit

Washington, Jan. 13.—William T. Chantland, special assistant to the attorney general, told a representative of The Iron Trade Review that the government will be ready to proceed with its case against the American Can Co., et al., at Baltimore, soon after the defendants file their answers to the government's petition. The answers must, according to the court order, be filed by Jan. 31.

To date but two answers have been received, one of them from the most distant defendant, the Hawaiian Pineapple Co., Ltd., Honolulu, Hawaii. The other is from Michael Espert, Chicago. In all there are 36 defendants. Some of them, however, are defendants in a nominal sense only, including the two from whom responses have been received. They show in their answers they have had no connection with the American Can Co. other than through the leasing of plants and machinery.

HUNDRED THOUSAND

Was Decline of English Stocks Last Year—Increase in Last Week.

For the first time in many months, pig iron stocks in Connall stores in the Middlesbrough, English, district, showed an increase during the week ended Dec. 30. In that period, they increased 4,110 tons, or from 135,877 tons on Dec. 23 to 139,987 tons. The net loss of stocks in the Middlesbrough district during the calendar year 1913 is shown by these figures to have been 101,636 tons. In the Cumberland district, the stocks on Dec. 30 remained unchanged at 8,958 tons, where they have stood for three weeks past. The net decline in stocks in the Middlesbrough district during the year was 29,465 tons.

Operations in the Middlesbrough district during the final week of the year were reduced by two furnaces to 74 stacks, which compares with 87 on the corresponding date a year ago. In the Cumberland district, there was a loss of one furnace over the preceding week. The active list in that district numbered 23, compared with a similar number a year ago. Scotch furnaces remain unchanged with 67 active.

A statement of the stocks and furnaces blowing in recent weeks and of the iron on hand one year previously in both the Middlesbrough and Cumberland districts is shown in the appended table:

MIDDLESBROUGH DISTRICT.

		Stocks.	Furnaces.
Dec.	30	139,987	74
Dec.	25	135,877	76
Dec.	18	142,556	76
Dec.	11	143,800	76
Dec.	4	148,595	77
Nov.	27	150,599	79
Nov.	20	151,233	79
Nov.	13	152,372	81
Nov.	6	156,415	81
Oct.	30	158,281	81
Oct.	23	164,837	81
Oct.	16	167,099	81
Oct.	9	168,474	81
Oct.	2	170,848	81
Sep.	25	171,887	83
Sep.	18	175,803	85
Sep.	11	179,360	88
Sep.	4	183,140	89
Aug.	28	187,269	..
Jan.	1	241,623	..

CUMBERLAND DISTRICT.

		Stocks.	Furnaces.
Dec.	30	8,958	23
Dec.	25	8,958	24
Dec.	11	9,068	24
Dec.	8	8,958	23
Dec.	4	9,068	24
Nov.	27	10,341	24
Nov.	20	10,891	24
Nov.	13	11,131	24
Nov.	6	11,240	24
Oct.	30	12,025	26
Oct.	23	12,889	26
Oct.	16	13,189	26
Oct.	9	13,899	26
Oct.	2	16,968	25
Sep.	25	17,720	25
Sep.	18	18,181	24
Sep.	11	18,829	24
Sep.	4	19,601	24
Aug.	28	19,761	..
Jan.	1	36,423	..

SEVEN THOUSAND TONS

Will be Required by Loft Building in New York—New Contracts.

New York, Jan. 14. (By wire.)—Bids are being taken for a large loft for the National Cloak & Suit Co., West Twenty-fifth street, this city, requiring 7,000 tons. The Eastern Steel Co. will furnish 2,500 tons of shapes to the Pennsylvania Steel Co. for a large viaduct taken by the latter at Wilkesbarre and 1,000 tons of plates for this work have gone to an eastern maker.

The Chicago fabricating shops are provided with a fair volume of miscellaneous business and some of them have enough orders to run conservatively for the next three months. About the only new project in the city of Chicago is the building which Lyon & Healy expect to erect on the site of the Wellington Hotel, Jackson boulevard and Wabash avenue. The new building will be 10 stories and will require approximately 2,500 tons of steel, but specifications will not be issued for several months.

CONTRACTS PLACED.

Freight station, Pennsylvania Lines West, Pittsburgh, 1,600 tons, the McClintic-Marshall Co.

Buildings for Beacon Mfg. Co., New Bedford, Mass., 400 tons, the McClintic-Marshall Co.

Buildings for Chicago Railway Equipment Co., Chicago, 600 tons, McClintic-Marshall Co.

The Lackawanna Bridge Co., coal handling outfit for export to Cuba, requiring about 250 tons.

The Walsh Construction Co., Davenport, Ia., steel on New York state barge canal contract 116, taking about 400 tons steel.

Kansas City Terminal Ry. Co., structural steel and iron for cinder pit, 108 tons, to the Kansas City Structural Steel Co.

Chicago Telephone Co., alterations and addition to Kedzie avenue office building, Chicago, 115 tons, to American Bridge Co.

Burton Schwartz Cypress Co., saw mill buildings, Jacksonville, Fla., 750 tons.

Plant for American Ice Co., Amsterdam avenue and 184th street, New York City, 600 tons, to the Hinkle Iron Works.

State Homeopathic Hospital, Middletown, N. Y., 200 tons, to John K. Cooke's Sons, Athenia, N. J.

Apartment for Lenox Hill Realty Co., East Sixty-third street and Park avenue, New York City, 570 tons, to the Belmont Iron Works.

Chronicle building, Augusta, Ga., 400 tons, to the John Eichleay Jr., Co.

Grandstand for race track at Havre-de-Grace, Md., 210 tons, to the Phoenix Bridge Co.

CONTRACTS PENDING.

Fourteenth Regiment armory, East End, Pittsburgh. Bids not yet asked.

Tenth regiment armory, Waynesburg, Greene county, Pa. Bids not yet asked.

H. S. Kerbaugh, Inc., New York, is low bidder on state's Erie basin terminal in connection with the state barge canal, Buffalo, requiring fully 600 tons of reinforcing bars and a considerable tonnage of steel sheet piling. H. S. Kerbaugh is president of the Empire Engineering Co., 700 Telephone building, Buffalo.

Warehouse for Baltimore Bargain House, Baltimore, about 1,000 tons of reinforcing bars for concrete construction required.

Courthouse, Albany, N. Y., 2,000 tons, bids to be received Jan. 27.

State Forestry School, Syracuse, N. Y., 300 tons. Bids asked for Jan. 29.

BRIDGE AND STRUCTURAL WORK.

Bridge work, New York State Highways Department, 800 tons, McClintic-Marshall Co.

Chicago, Milwaukee & St. Paul Ry. Co., I-beam spans, 200 tons, to Milwaukee Bridge Co.

Chicago, Milwaukee & St. Paul Ry. Co., deck girder spans, 303 tons, to Wisconsin Bridge & Iron Co.

Viaduct for Wilkesbarre Connecting railroad, Wilkesbarre, Pa., 6,000 tons, awarded to the Pennsylvania Steel Co.

Operators of Merchant Furnaces Organize

Blast furnace owners and operators representing an aggregate annual capacity of 13,639,000 tons of pig iron from merchant furnaces with an investment of practically $200,000,000, in session in New York, Jan. 8, organized the American Pig Iron Association. The membership comprises almost the entire merchant pig iron output of the United States.

Purposes of the organization as stated in the by-laws are: The discussion of all problems entering into the manufacture and sale of pig iron; the standardization, as far as practicable of all grades; the securing of equitable freight rates; the cultivation of closer relationship with customers; the discussion of methods for improving the quality of service given to the users of the product, and as a result of research and investigation of new methods, the reducing of the cost and improvement of the quality of the iron produced as well as the adoption of a uniform form of contract to be used between producer and consumer.

Officers elected were:

President—Joseph G. Butler Jr., Youngstown.

Vice Presidents—Chicago district—M. Cochrane Armour, Iroquois Iron Co.

Central district—Joseph H. Frantz, Columbus Iron & Steel Co.

Buffalo district—W. A. Rogers, Rogers, Brown & Co.

Philadelphia district—John B. Newton, Virginia Iron, Coal & Coke Co.

Treasurer—Frank B. Richards, M. A. Hanna & Co., Cleveland.

General Secretary—John A. Penton, Cleveland.

The vice president for the southern district was to be elected later.

RAILROAD BUYING

Is Being Done in a Very Moderate Way—Some New Contracts.

Railroad buying is very moderate, especially in cars. There is considerable inquiry for track fastenings.

In the west the car market continues slow. Most of the shops are running at about one-half capacity, with the exception of the passenger car works of the Pullman Co., which is well supplied with business. The Chicago Elevated Railways Co. has ordered 128 all steel cars for early delivery.

The Detroit Copper & Brass Rolling Mills, Detroit, has closed a contract with the Cincinnati, New Orleans & Texas Pacific railroad for 253,000 pounds of copper wire, which will be used in the installation of a new train dispatch service on the Alabama & Great Southern railway, a subsidiary. The delivery is to be made at Birmingham, Ala.

CAR ORDERS.

The complete order recently placed by the Grand Trunk railroad gives 500 flat cars to the Western Car & Foundry Co., 500 stock cars to the National Car Co., 54 passenger cars to the Canadian Car & Foundry Co., 32 passenger cars to the Osgood-Bradley Car Co., 10 passenger cars to the National Car Co., and nine passenger cars to the Pullman Co.

The American Car & Foundry Co. has taken 100 steel railway cars from the New York Municipal Railways Corporation.

The Chicago Elevated Railways has ordered 120 elevated coaches from the Cincinnati Car Co.

CAR ORDERS PENDING.

The Santa Fe railroad is inquiring for 500 box and 300 automobile cars.

The Delaware, Lackawanna & Western railroad is in the market for 10 steel coaches.

The Virginian railway is in the market for 1,000 steel gondolas.

The Kanawha & Michigan railroad is inquiring for 1,000 steel gondolas.

Steel Making Pig Iron Declines

Pittsburgh, Pa., Jan. 14. (By wire.)—Steel-making grades of pig iron have practically touched the decidedly low levels prevailing in the early part of 1911, which were the lowest to come out for many years. Bessemer pig iron, which had been listed at $14.25, valley, now is quotable at $14, valley, or at the same figure ruling three years ago. Basic is listed at a spread of $12.50 to $12.75, although some makers have withdrawn the minimum figures. The demand for both grades is light. Foundry grades are fairly active, but prices low.

The Marion Light & Power Co., Marion, S. D., has been incorporated for $25,000 by J. A. Heeren, John Groepel, M. H. Dains, S. H. Dains.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through First Half 1914.)

Bessemer	$14.90 to 15.15
Basic	13.40 to 13.65
No. 2 foundry	13.65 to 13.90
Malleable	13.90
Gray forge	13.40

(The freight from valley points is 90c.)

CLEVELAND

(Through First Half 1914, Delivered in City.

No. 1 foundry	$14.00
No. 2 foundry	13.50
No. 2 southern	15.10 to 15.35
Bessemer	14.90 to 15.15

CINCINNATI

(Prompt and First Half.)

Southern foundry No. 1	$14.25 to 14.75
Southern foundry No. 2	13.75 to 14.25
Southern foundry No. 3	13.25 to 13.75
Southern foundry No. 4	13.00 to 13.50
Southern gray forge	12.75 to 13.25
Mottled	12.75 to 13.00
Southern No. 1 soft	14.50 to 15.00
Southern No. 2 soft	14.00 to 14.50
Southern Ohio No. 2	14.20 to 14.70
Southern Ohio No. 3	13.70 to 14.20
Southern Ohio No. 4	13.45 to 13.95
Silveries, 8 per cent silicon	17.70 to 18.20

(Freight from Ironton, $1.20; from Birmingham, $3.25.)

CHICAGO

(Delivered Chicago, until July 1, 1914, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	$15.50
Northern foundry No. 2	14.25
Southern foundry No. 2	15.35
Jackson Co. silveries, 8 per cent	18.40
South'n silveries, 5 per cent sil.	16.85
Alabama basic	15.35
Malleable	14.25

PHILADELPHIA

(Prompt and first half shipment delivered to consumer's plants in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$15.25 to 15.50
Northern No. 2X foundry	14.75 to 15.25
Northern No. 2 plain	14.50 to 14.75
Standard forge (Eastern Pa.)	14.00 to 14.25
Virginia No. 2X	15.55 to 15.80
Southern No. 2	15.00 to 15.50
Standard low phos., Phila.	20.75 to 21.50
Lebanon low phos., furnace	17.50 to 18.00
Malleable	15.00 to 15.50
Basic (Eastern and Central Pa.)	14.00 to 14.25
Middlesbrough, English No. 3 (on dock)	14.50 to 14.75

NEW YORK

(Prompt and first half delivery, prices based at Jersey City and at Jersey points near tidewater.)

Northern No. 1X foundry	$14.75 to 15.00
Northern No. 2X foundry	14.50 to 14.75
Northern No. 2 plain	14.25 to 14.50
Virginia No. 2X	15.85 to 16.10
Southern No. 2	14.75 to 15.25
Malleable	14.50 to 15.00
Gray forge	14.25 to 14.50

ST. LOUIS

(Throughout This Year.)

Southern No. 1	$15.25 to 15.75
Southern No. 2	14.75 to 15.25
Southern No. 3	14.25 to 14.75
Southern No. 4	13.75 to 14.25

(Freight, Birmingham to St. Louis, $3.75.)

BIRMINGHAM

(For Southern Delivery.)

No. 1 foundry	$11.50 to 12.00
No. 2 foundry	11.00 to 11.50
No. 3 foundry	10.75 to 11.00
No. 4 foundry	10.50 to 10.75
Gray forge	10.50 to 10.75
Mottled	10.25
Standard basic	11.00 to 11.50
Off basic	10.50 to 11.00
Charcoal	25.00

BUFFALO

(Delivered in city first and second quarters.)

No. 1 foundry	$13.25 to 13.50
No. 2X foundry	13.00 to 13.25
No. 2 plain	13.00
No. 3 foundry	12.75 to 13.00
Gray forge	12.50 to 12.75
Malleable	13.00 to 13.50
Basic	13.50 to 14.00
Charcoal	17.00 to 19.50

Ferro Alloys

English 80 per cent ferro manganese, prompt and forward delivery, $45, seaboard.

Fifty per cent ferro-silicon, $73, Pittsburgh, or Philadelphia, for carloads; $72 for larger lots, and $71 for 600 tons or more. Twelve to 13 per cent, $23. Eleven to 12 per cent, $22. Ten to 11 per cent, $21. Nine to 10 per cent, $20, f. o. b. Globe, Jisco, and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 to 30 cents higher, respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	1.80 to 1.90	1.85 to 2.00
Wise county district:—		
Foundry coke	$2.50 to 3.10	$2.65 to 3.10
Furnace coke	2.10 to 2.25	2.10 to 2.25
Pocahontas district:—		
Foundry coke	$2.50 to 3.00	$2.50 to 3.00
Furnace coke	2.00 to 2.40	2.10 to 2.60
New River district:—		
Foundry coke	$2.85 to 3.50	$2.85 to 3.50
Furnace coke	2.50 to 2.75	2.50 to 2.75

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer prices are: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania furnace points range from 35 to 75 cents per ton.

Semi-Finished Material

PITTSBURGH

Bessemer 4 x 4 billets with 0.25 carbon and less, $20.00; open-hearth rolling billets, $20.00; Bessemer sheet bars, $21.00; open-hearth sheet bars, $20 to $21, f. o. b. makers' mill. Forging billets, $24 to $25, Pittsburgh. Wire rods, $25.50; muck bar, $29, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: 4 x 4-inch open-hearth and Bessemer, rolling billets at $21.50 to $22.50, and forging billets from $26.50 to $27.50; muck bar, $28.00 to $30.00.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.20c to 1.25c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.33c to 1.38c.

PHILADELPHIA

Standard structural shapes, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.35c to 1.40c.

NEW YORK

Standard structural shapes, base sizes, delivered in metropolitan district, 1.36c to 1.41c.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¾ to 100 inches, 1.15c to 1.20c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inches thick, 6⅝ to 100 inches wide, 1.33c to 1.38c.

PHILADELPHIA

Tank plates, base sizes, delivered to consumers' plants in Philadelphia and vicinity, 1.35c to 1.40c.

NEW YORK

Tank plates, base sizes, delivered in the metropolitan district, 1.36c to 1.41c.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	1.85c to 1.90c
No. 28 tin mill black	1.80c to 1.85c
No. 28 galvanized	2.85c to 2.90c
No. 10 blue annealed	1.35c to 1.40c
No. 28 painted corrugated	2.05c to 2.10c
No. 28 galzanized, corrugated	3.00c to 3.05c
Tin plate, 100-pound cokes	$3.40

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.60c to 1.65c.

Pipe and Boiler Tubes

PITTSBURGH

	Black Butt-Weld.	Galv. Weld.
Steel, ¾ to 3 inches	80	71½
Iron, ¾ to 2½ inches	70	61
	Lap-Weld.	
Steel, 2½ to ½ inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	71	..
Iron, 3½ to 4½ inches	60	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.35c for open-hearth, carload lots; less than 500 tons, 1.35c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c base, Pittsburgh; track bolts, 2.00c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.45c to 1.50c.

CHICAGO

Light rails, carloads 25 to 45-pound, 1.25c; base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21.50 to $22.50; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Chicago:

Angle bars, 1.50c; railroad spikes, 1.50c to 1.55c; smaller sizes, spikes, 1.75c base; track bolts with square nuts, 2.05c to 2.10c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.30c to 1.35c, Pittsburgh; Bessemer and open-hearth steel bars, 1.20c; plow and cultivator, 1.20c; channels, angles, zees, tees, under 3 inch, 1.30c, all f. o. b. mill.

Hoops in carload lots, 1.40c, Pittsburgh; in less than carload lots, 1.45c; bands, 1.20c base, with net extras as per standard steel.

Cold rolled and ground shafting, 63 to 65 per cent off in carloads and 58 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.12½c to 1.20c; hard steel bars, rerolled, 1.30c; soft steel bars, bands and small shapes, 1.33c to 1.38c; hoops, 1.58c; smooth finished machinery steel, 1 inch and larger, 1.68c; shafting, 65 per cent off list for carload lots, 60 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.35c to 1.40c on contract and common bar iron, 1.22½c to 1.27½c. Cut nails, 1.80c to 1.90c, Philadelphia. Shafting, 64 to 65 off in carloads and 62 to 63 off in less than carloads in base territory.

NEW YORK

Soft steel bars delivered in the metropolitan district, 1.36c to 1.41c; common iron bars, 1.25c to 1.30c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 1.60c to 1.65c, Pittsburgh; cone head boiler rivets, 1.70c to 1.75c. Small rivets, 80 and 10.

Structural rivets, Chicago, 1.85c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 80 and 2½; cut threads, 75 and 17½; larger and longer, 70 and 15.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 80 and 7½; cut, 80 and 2½; larger and longer, 70, 10 and 10.

Gimlet and cone point lag or coach screws, 80 and 20.

Hot pressed square, blank or tapped nuts, $6.00 off list; hot pressed hexagon blank or tapped, $6.70.

Cold pressed C. & T. square, blank, or tapped, $3.80 off; hexagon, blank or tapped, ⅝ inch and larger, $6.80 off; ½-inch and smaller, $7.40.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.55; retailers' carload lots, $1.60; cut nails (western makers) jobbers' lots, $1.60; painted barb wire, jobbers' carload lots, $1.55; retailers' carload lots, $1.60; plain wire to jobbers in carloads, $1.35; and to dealers in carloads, $1.40; polished staples, $1.55; galvanized staples, $1.95.

CHICAGO

Wire nails, jobbers' carload lots, $1.73; retailers' carload lots, $1.78; retailers' less than carolad lots, $1.83; painted barb wire, jobbers' carload lots, $1.73; retailers' carload lots, $1.78; retailers' less than carload lots, $1.83, with 40c for galvanizing; plain wire, jobbers' carload lots, $1.53; retailers' carload lots, $1.58.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $26.50; 6 to 12 inches, $25.00; larger sizes, $23.50; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $22.00 to $23.00, f. o. b. New York, in carload lots.

BIRMINGHAM

Water main, 4-inch, $22.50; 6-inch and up, $19.50. Gas main: $1 per ton higher than water main. Special fittings, $47.50 to $52.50.

Old Material

PITTSBURGH

(Gross Tons Delivered.)

Heavy melting scrap	$11.00 to 11.25
Rerolling rails	13.50 to 14.00
Malleable	10.50 to 10.75
Bundled sheet scrap	6.75 to 7.00
Iron axles	22.00 to 23.00
Old iron rails	13.00 to 13.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	11.50 to 12.00
Old car wheels	11.00 to 11.50
Low phosphorus	14.25 to 14.50
Machine shop turnings	7.00 to 7.25
No. 1 busheling	9.00 to 9.50
Cast borings	7.75 to 8.25
No. 1 cast scrap	11.50 to 12.00

PHILADELPHIA

Gross tons delivered to consumers' plants, in eastern Pennsylvania and western New Jersey:

Old iron rails (nominal)	$15.50 to 16.00
Old steel rails (rerolling	12.00 to 12.50
No. 1 heavy melting steel	10.00 to 10.25
Old car wheels	12.00 to 12.50
Old iron axles (nominal)	20.00 to 21.00
Old steel axles	15.75 to 16.25
No. 1 railroad wrought	12.75 to 13.00
Wrought pipe	8.75 to 9.25
Cast borings	7.75 to 8.00
Machine shop turnings	7.00 to 7.25
Heavy cast (broken)	12.00 to 12.50
Malleable	9.00 to 9.50
Stove plate	9.00 to 9.50
No. 1 forge	8.00 to 8.25
Low phosphorus	14.00 to 14.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg, and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$13.50
Old steel rails (under 3 ft.)	12.00 to 12.50
Old steel rails (over 6 ft.)	12.00 to 12.50
Relaying rails	23.00 to 25.00
Old steel boiler plate	8.00 to 8.50
Malleable iron (railroad)	11.00 to 11.50
Axle turnings	6.00 to 6.50
Steel axles	16.00 to 16.50
Malleable iron (agricultural)	8.00 to 8.50
Heavy steel	9.50 to 10.00
Country mixed steel	8.50 to 8.75
Bundled sheet scrap	6.50 to 7.00

Net Tons

No. 1 R. R. wrought	$ 9.50 to 10.00
No. 1 busheling (new)	8.00 to 8.50
No. 1 busheling (old)	8.00 to 8.25
No. 1 machine cast	10.50 to 11.00
No. 1 dealers' wrought	8.00 to 8.50
Machine shop turnings	4.75 to 5.25
Pipes and flues	7.50 to 8.00
Wrought drillings	4.75 to 5.25
Cast borings	5.25 to 5.75
Stove plate	8.25 to 8.50
Wrought iron arch bars (nom.)	13.00
Wrought iron piling plate (nom.)	11.75

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Old car wheels	$11.25 to 11.75
Rerolling rails (5 ft. and over)	11.00 to 11.50
Old steel rails (3 ft. and und.)	10.25 to 10.75
Frogs, switches and guards	9.00 to 9.50
Heavy melting steel	9.00 to 9.50
Shoveling steel	8.00 to 8.50

Net Tons

No. 1 R. R. wrought	$ 8.50 to 9.00
No. 2 R. R. wrought	7.75 to 8.25
Arch bars and transoms	12.00 to 12.50
Knuckles, couplers and springs	9.00 to 9.50
Shafting	11.50 to 12.00
Iron car axles	17.00 to 17.50
Steel car axles	11.75 to 12.25
Locomotive tires	10.50 to 11.00
Cut forge	7.75 to 8.25
Pipe and flues	6.25 to 6.75
No. 1 cast	10.00 to 10.50
No. 1 busheling	7.25 to 7.75
No. 2 busheling	5.75 to 6.00
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	9.50 to 10.00
Cast borings	3.75 to 4.25
Machine shop turnings	4.00 to 4.50
Agricultural malleable	8.50 to 9.00
Railroad malleable	9.00 to 9.50
Angle bars, splices, etc., iron	11.75 to 12.25
Angle bars, steel	8.00 to 8.50
Stove plate and light cast scrap	8.75 to 9.25

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for eastern Pennsylvania delivery:

Old car wheels (nominal)	$10.00 to 10.50
Heavy steel axles	14.00 to 14.50
Steel shafting (nominal)	12.00 to 12.50
No. 1 heavy melting steel	7.25 to 7.50
No. 1 R. R. wrought	10.75 to 11.00
Wrought pipe (not galvanized)	6.50 to 6.75
Clean cast borings	5.00 to 5.50
Machine shop turnings (nominal)	4.50 to 4.75
Heavy cast	9.50 to 10.00

Stove plate	6.75 to 7.00
Grate bars	6.50 to 6.75

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.10 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, N. J., $1.10 from New York.

CINCINNATI

Gross Tons

Old iron rails	$10.50 to 11.50
Old steel rerolling	9.50 to 10.00
Old iron axles	15.50 to 16.00
Heavy melting scrap	8.50 to 9.00
Relaying rails	18.50 to 19.00

Net Tons

Old No. 1 R. R. wrought	$ 8.25 to 8.75
Bundled sheet scrap	4.50 to 5.00
No. 1 yard wrought	6.50 to 7.00
No. 1 machine cast	9.50 to 10.00
No. 1 busheling	6.00 to 6.50
Stove plate	6.75 to 7.25
Machine shop turnings	4.00 to 4.50
Cast borings	4.00 to 5.00
Heavy turnings	5.00 to 5.50
Mixed cast	7.50 to 8.00
Breakage	5.00 to 6.00
Malleable	6.50 to 7.00

BIRMINGHAM

Old iron axles (light)	$15.00 to 15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Tram car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.25

BUFFALO

Gross Tons

Heavy melting steel	$10.00 to 10.75
No. 1 R. R. and mch. cast scrap	12.00 to 12.50
No. 1 R. R. wrought scrap	12.00 to 12.50
Old steel axles	17.00 to 17.50
Old iron axles	22.50 to 23.00
Car wheels	11.00 to 11.50
Railroad malleable scrap	10.50 to 11.50
Machine turnings	5.25 to 5.75
Heavy axle turnings	8.25 to 9.00
Cast iron borings	5.75 to 6.25
Low phos. steel scrap	15.00 to 15.75
Old iron rails	15.00 to 15.50
Boiler plate sheared	11.50 to 12.00
Bundled sheet scrap	6.25 to 6.75
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	9.50 to 10.00
No. 1 busheling scrap	8.75 to 9.25
No. 2 busheling scrap	6.00 to 6.50
Wrought pipe	8.50 to 9.00
Bundled tin scrap	12.00

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$10.75 to 11.25
Old iron rails	11.00 to 11.50
Re-rolling rails (5 ft. and over)	11.75 to 12.25
Old steel rails (3 ft. and und.)	10.50 to 11.00
Light sec. relayers (45 pounds and und.) subject to inspec.	23.00 to 23.50
Relaying rails, subject to inspec.	23.00 to 23.50
Frogs, switches and guards	8.50 to 9.00
Shoveling steel	8.00 to 8.50

Net Tons

No. 1 railroad wrought	$8.00 to 8.50
No. 2 railroad wrought	7.75 to 8.25
Arch bars and transoms	11.50 to 12.00
Knuckles, couplers, springs	9.50 to 12.00
Shafting	12.50 to 13.00
Steel car axles	12.00 to 12.50
Iron car axles	15.00 to 15.50
Locomotive tires	10.00 to 10.50
Pipe and flues	6.00 to 6.50
Tank iron and cut boilers	6.00 to 6.50
No. 1 cut busheling	8.50 to 9.00
Cast iron borings	3.50 to 4.00
Machine shop turnings	5.00 to 5.50
Agricultural malleable	7.00 to 7.50
Railroad malleable	8.00 to 8.50
Stove plates	7.00 to 7.50
Angle splice bars (iron)	10.00 to 10.50
Angle splice bars (steel)	9.50 to 10.00
Cast iron	10.50 to 11.00

Store Prices

CINCINNATI

Steel bars, 1.75c to 1.90c; iron bars, 1.70c to 1.80c; plates and shapes, 1.85c to 2c; sheets, blue annealed, No. 10, 2c to 2.05c; black No. 28, 2.50c to 2.55c; galvanized, No. 28, 3.50c to 3.55c; cold rolled shafting, round, square, hexagon and flat, 55 to 58 off.

CLEVELAND

Steel bars, 1.80c; plates and shapes, 1.90c; iron bars, 1.85c; sheets, No. 10 blue annealed, 2.15c; No. 28 black, 2.60c; No. 28 galvanized, 3.60c.

CHICAGO

Steel bars, 1.65c; iron bars, 1.65c; hoops, 2.15c; shapes and plates, 1.65c; No. 10 blue annealed sheets, 1.95c; black, No. 28, 2.45c; galvanized, No. 28, 3.50c.

PHILADELPHIA

Steel bars, 1.80c; structural shapes, 1.80c; plates, 1.80c; iron bars, 1.70c.

NEW YORK

Steel bars, 2.00c; structural shapes, 2.05c; plates, 2.05c.

New England Foundrymen's Meeting

The 18th annual meeting of the New England Foundrymen's Association was held at the rooms of the Exchange Club, Milk and Batterymarch streets, Boston, Wednesday evening, Jan. 14, at 5 o'clock. The following officers previously placed in nomination were elected for the ensuing year: President, Chas. L. Nutter, Old Colony Foundry Co., East Bridgewater, Mass.; vice president, A. F. Corbin, Union Mfg. Co., New Britain, Conn.; treasurer, Geo. H. Gibby, Gibby Foundry Co., East Boston, Mass.; secretary, Fred F. Stockwell, Barbour Stockwell Co., Cambridge, Mass.; executive committee, Chas. A. Reed, Reed, Fears & Miller, Boston; J. C. Hosford, Magee Furnace Co., Chelsea, Mass.; D. K. Bartlett, Builders' Iron Foundry Co., Providence, R. I.; W. B. Leach, Hunt-Spiller Mfg. Co., Boston; J. L. Harley Jr., Millett & Harley Co., Springfield, Mass. Dinner was served at 6 o'clock.

Discusses Panaman Problems

Pittsburgh, Jan. 13.—Members of the Pittsburgh Foundrymen's Association last night were told of the many difficult problems confronted by the government and independent contractors in the building of the Panama canal, by W. B. Childers, of Columbus, O., who was superintendent of construction on the lock gates for the McClintic-Marshall Co., Pittsburgh.

FROM ALL DIRECTIONS

Come Reports of Decided Increase in New Business.

New York, Jan. 14. (By wire.)—From all directions and in practically all lines, manufacturers report a marked increase in new bookings of finished products during the past week, which has tended to strengthen the belief that permanent improvement has set in. This development continues to support a very cheerful sentiment among manufacturers.

Heavy sales of bars and billets have been made at Pittsburgh and in the Chicago district. Car builders have closed a large tonnage at full reported prices, 1.20c, Pittsburgh, notwithstanding some quotations below that figure were still offered in that territory by certain makers the past week.

The withdrawal of wire prices had the effect of increasing the tonnage considerably.

RAIL MILLS

In Chicago Well Supplied With Orders—Able to Run Till March.

New York, Jan. 14. (By wire.)—The Seaboard Air Line has entered the market for 20,000 tons of rails. The Southern railroad tonnage is still pending. Rail mills in the Chicago district have accumulated enough business in open-hearth steel to run steadily until March and specifications are coming in more freely. In some cases, roads have released suspended orders. Reports from Canada state that the Canadian Northern is planning an expenditure of $10,000,000 for rolling stock.

Large Purchases By Pipe Company

New York, Jan. 14. (By wire.)—Further developments indicate that the purchases of the United States Pipe Foundry Co. may reach 100,000 tons. The leading southern maker alone took about 50,000 and it is known that heavy lots went to other southern and northern makers. Southern sales are understood to have been closed on the basis of $10.50 to $10.75 for No. 2.

Borrowed Money to Pay Tennessee Co. Dividends

President Bowron Gives Interesting Testimony in Steel Corporation Suit—Witnesses Tell of Keen Competition for Business—The Hearing at Birmingham

Birmingham, Ala., Jan. 13.—Hearings in the suit of the United States government to dissolve the United States Steel Corporation are being held here by Special Examiner J. A. Brown. The government is represented by H. C. Colton, special attorney from the department of justice, and the Steel Corporation by David A. Reed, of Pittsburgh.

The trend of evidence submitted by the defense is to the effect that the purchase of the Tennessee Coal, Iron & Railroad Co. by the Steel Corporation has not caused a monopoly in this district, that the Corporation has not attempted to stifle competition and that a free open market has been in effect at all times. Evidence was adduced also to show that the acquisition of the property of the Tennessee company has been a benefit to the Birmingham district in better conditions in the manufacture of iron and steel products.

James Bowron a Witness

The first witness was James Bowron, president of the Gulf States Steel Co., formerly the Southern Iron & Steel Co.

Mr. Bowron stated that he was connected with the Tennessee company for a number of years as treasurer and vice president. He stated that he retired from the services of the Tennessee company in 1901, and in 1910 was elected to the vice presidency of the Southern Steel Co. and later became president.

Mr. Bowron stated that after he had been elected president of the Gulf States Steel Co. that company had purchased 1,500 acres of self-fluxing ore lands in Shades valley. He stated that two other tracts were offered to his company at that time.

On direct question by Attorney Reed, Mr. Bowron gave his opinion there are sufficient ore lands in this district owned by independent parties, that could be bought, to supply the needs of another steel company.

Witness explained the various products which his company sold in competition to the products of the Steel Corporation.

In answer to question of counsel, he stated that he regarded the selling policy of the Steel Corporation as conservative. "We always know how the Steel Corporation stands," he said. "It never resorts to underhand methods or unfair means against a competitor."

Witness stated that on several occasions when the Southern Steel Co., the only competitor of the Tennessee company in Alabama, had run out of supplies, which was about to force the shutting down of its steel mills, that the president of the Tennessee company had come to their assistance, thereby preventing the closing down of their plants.

Borrowed to Pay Dividend

Mr. Colton asked about the dividends paid by the Tennessee company, and Mr. Bowron stated that as vice president and resident manager of the properties he had advised against the payment of the dividends but recommended that improvements be made. "I was compelled to go out and borrow the money to pay the dividends after they were declared," said Mr. Bowron.

Witness stated that the Steel Corporation, in his opinion, did not follow up its advantage in raising prices during prosperous times.

"Were I a stockholder in the Steel Corporation I would have written them stating my opinion on this subject, as there has been times when it seemed to me they should have raised their prices," said Mr. Bowron.

Competition is Real

J. D. Moore, president of the Moore & Hindley Hardware Co., of this city, said that according to his experience and observation competition between the steel and iron companies is keen.

Rush Simpson, buyer for the Wimberly-Thomas Hardware Co., testified that he purchased about 50 per cent of the steel products handled by his firm from the American Steel & Wire Co., and that he found competition keen.

Paschal G. Shook, member of the firm of Shook & Fletcher, iron brokers, said that for several years he was an official of the Tennessee company, and that through his father, who was a director in the company, he kept in close touch with the company's affairs.

When questioned by Attorney Reed for the Steel Corporation relative to the effect of the purchase by the Corporation of the Tennessee company, Mr. Shook said he had not considered the purchase as monopolistic in its character. As an expert on the ore resources of the Birmingham district, he testified that there were plenty of rich ore lands to be had in the Birmingham district.

He testified the extensive improvements made in the properties of the Tennessee company had greatly benefited the Birmingham district.

As a large purchaser of iron products he had found keen competition between the several companies.

A. C. Converse, president of the Price-Evans Foundry Co., of Chattanooga, said his company purchased considerable iron and that the competition between the iron and steel companies for the business had always been keen and that the representatives of the various companies visited his company. He stated that the quotations furnished him varied considerably.

Knows of No Pool

C. A. Hunt, president of the Memphis Steel Construction Co., testified he was formerly sales manager of the firm of Worth & Sons, Cincinnati. He said that he did not know of any pool among the bar plate men while he was selling steel. He stated that while sales manager he found competition was keen.

He said his company at Memphis purchased about 3,000 tons of shapes, bars and plates annually, and that quotations varied from $1 to $4 per ton.

James Bowron, president of the Gulf States Steel Co., who was recalled to the stand, stated that at the time the Steel Corporation acquired the Tennessee company this company was making about 1 per cent of the steel rails produced in the country. He said that all of the ferro-manganese made in this country was produced by the Steel Corporation. He said that this product was made in a small blast furnace from ore either imported or mined in Arkansas.

President Hedges, of the Casey-Hedges Co., of Chattanooga, stated that he was a buyer of plates and that he always found competition keen among the companies. He stated that less than 50 per cent of his purchases were made from the Tennessee company.

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Cleveland, January 15, 1914

Business and Government Policies

In a recent address to the presidents of the subsidiary companies of the Steel Corporation, Judge Gary expressed fear that those who were claiming to represent the administration in its policies toward business were not authorized to speak to the full extent of their claims. Certain it is that there has been considerable irresponsible talk by newspapers, and perhaps by men in office, as to relations of government to business. The Washington correspondent of THE IRON TRADE REVIEW was instructed to obtain as definitely as possible a statement as to the policy which the administration would pursue. Attention was called especially to Judge Gary's address. Officials would not however, make further declaration of policy than to indicate very plainly that the letters of President Wilson and Attorney General McReynolds in connection with the telephone agreement were intended clearly to indicate the frank attitude of the administration toward business. It will be recalled that the closing paragraph of the letter of the Attorney General to Vice President Kingsbury, of the American Telephone & Telegraph Co., said:

"May I take this occasion to say that the administration earnestly desires to co-operate with and to promote all business conducted in harmony with law; and that, without abating the insistence that the statutes must be observed, it will always welcome opportunity to aid in bringing about whatever adjustments are necessary for the re-establishment of lawful conditions without litigation."

President Wilson on that occasion said he is gaining the "impression more and more from week to week that the business men of the country are sincerely desirous of conforming to the law, and it is very gratifying indeed to have occasion, as in this instance, to deal with them in complete frankness and to be able to show them all that we desire is an opportunity to co-operate with them."

Recent developments show that the administration intends to follow out the policy as outlined by the president and attorney general. The difficult problem of how to dissolve the New York, New Haven & Hartford railroad without a lawsuit has been solved with the exception of the working out of the details. This is a triumph for peaceful dissolution and means much to the business world.

The very satisfactory report of the Southern Pacific railroad, which has just been made public, shows that dissolution has not worked disastrously with that railroad. *The New York Financial Chronicle* says that it is remarkable that the separation of the Southern Pacific and Union Pacific, made necessary by the decree of the United States Supreme Court, and which it was supposed "would be especially hurtful to the Southern Pacific and involve its partial dismemberment", has now been carried to completion without any change at all having occurred in the status of the Southern Pacific. In regard to the Union Pacific, where there has been a decided change in stock ownership, the dissolution program seems to be working out satisfactorily. The action of the Union Pacific in distributing to the common stockholders as a bonus about $80,000,000 of common and preferred stock of the Baltimore & Ohio railroad was a part of the plan for the complete separation of the Union Pacific and Southern Pacific lines, the attorney general having sanctioned, some time ago, an exchange of Southern Pacific stock for Baltimore & Ohio stock with the understanding that the latter was to be disposed of.

While thus quietly big problems are being worked out by high officials of the government and corporations, Secretary Redfield has announced an ambitious program for extending business to foreign lands by the reorganization of the bureau of foreign and domestic commerce and he would also inquire into the efficiency of industrial combination, study economical laws governing the fixing of retail prices, collect facts concerning public service corporations and inquire into the cost of the production of various products. In some of his plans, especially for improving the bureau of foreign and domestic commerce, the secretary will have the hearty co-operation of progressive business men, who will also support other policies if it becomes apparent that they will be carried on with due respect to the business interests of the country. It is announced that the department of commerce will soon make public the result of its investigation into the cost of production of pottery in Ohio and West Virginia. If it is shown that this investigation has been carried on thoroughly, as a scientifically conducted tariff commission would have done, the secretary will probably find little opposition to permitting him to

investigate the cost of clothing, as he desires to do. The country is anxious to get at the facts about business and wants as much and as accurate information as possible before there is any further tinkering with the tariff.

The Ford Distribution

The purity of the motives of Henry Ford and associates in deciding upon the plan of profit-sharing with their employes is not to be questioned. We do not for one moment doubt that they are entirely sincere in saying that they believe that social justice begins at home and that those who have helped the company in its great success should fully share its prosperity. We also believe they are right in saying that often workingmen do not get the proper percentage of the profits. It would be very much better in many cases for employers to pay their employes more liberally and to dispense with various philanthropic and charitable enterprises.

Having to this extent expressed our concurrence with the ideas of Mr. Ford and his associates, we still believe that his plan of distributing $10,000,000 this year to the employes of the company is unwise. As to the employes themselves, it is very questionable whether they will be permanently benefited. When, for example, a sweeper, who is getting 26 cents per hour, is advanced to more than 62 cents per hour, making his pay somewhat more than $5 for eight hours instead of $2.34 for nine hours, the effect upon him and his habits of life is not easy to be determined and we are strongly of the opinion that the sociological department which has been created by the company to see that men do not spend their extra compensation unwisely, will have its hands full, if it does its work faithfully. While many conscientious employes will be spurred on to greater effort and will faithfully try to show their appreciation of the company's munificence, what will happen if the calculation that the company will make $20,000,000 this year proves not to be well founded? The disappointment and dissatisfaction will be serious.

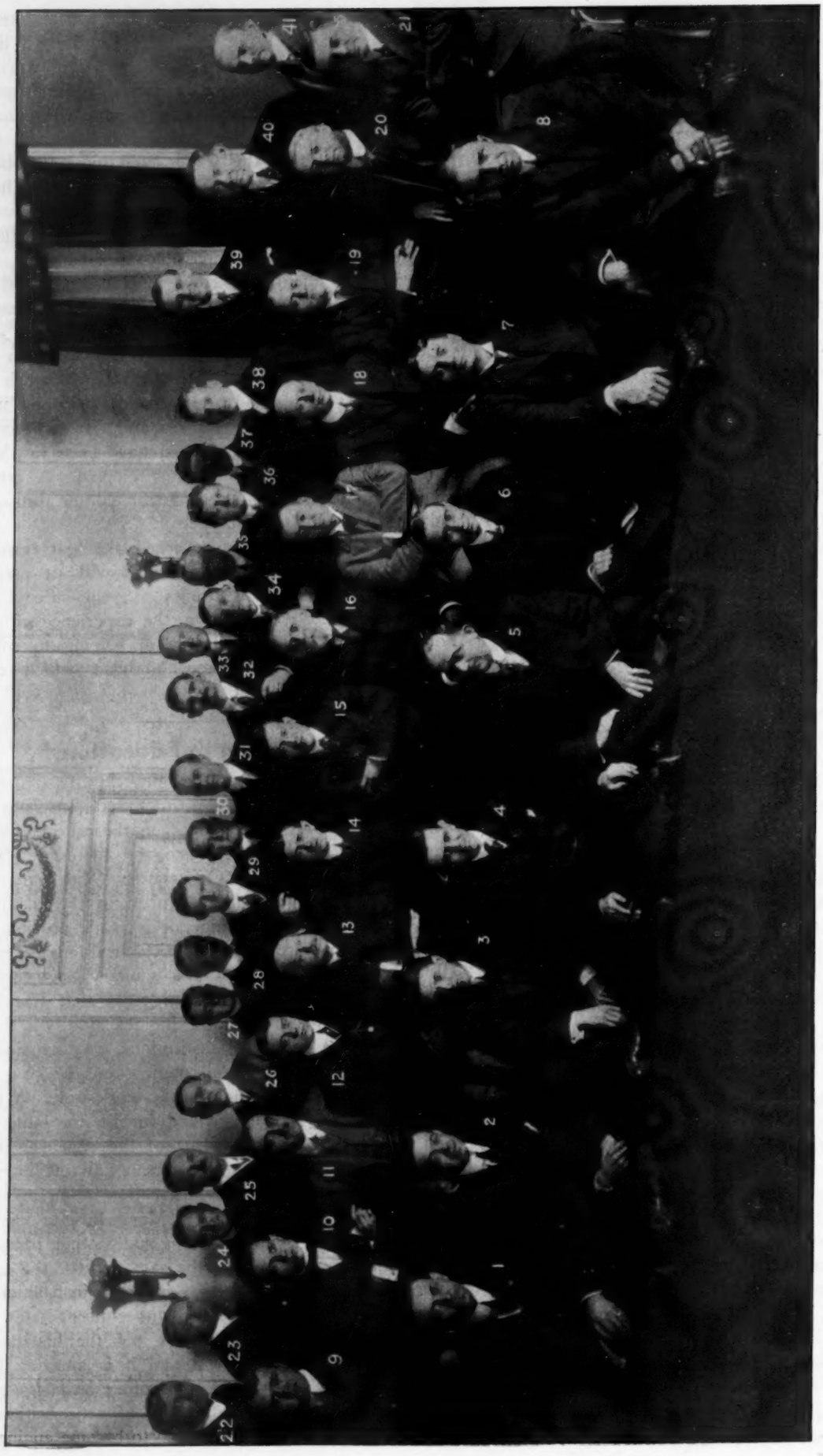
While being so keenly alive to the interests of their employes, it strikes us that Mr. Ford and the other stockholders might have been somewhat more considerate as to the effect upon other employers. "We think," said Mr. Ford, "that one concern can make a start and create an example for other employers, and that is our chief object." Unfortunately, few employers will find it possible to advance wages to anything like the scale of that which has been adopted by the Ford company. But this fact will not prevent a feeling of dissatisfaction among thousands of employes, not only in Detroit and the automobile industry, but in many other industries throughout the country. If, it may be argued, Mr. Ford can present his employes with $10,000,000, why cannot other manufacturers do likewise? During a period of business depression like the present, when a great many men are out of employment, those who have jobs will be likely to stick to them and the dissatisfaction due to the announcement of the Ford plan will not find expression openly. It will, however, be nursed in the breasts of the workingmen and will cause trouble when business revives. We do not believe that it can be truthfully stated that the wages paid by automobile manufacturers are, as a rule, too low. Often they are higher than the wages paid by other manufacturers. The Ford company has, however, set a new standard which will be impossible for many of its competitors to maintain. How much dissatisfaction will thereby be caused is now difficult to estimate, but that it will be considerable cannot be doubted.

Our objection to the Ford plan is not so much to the giving of $10,000,000 as to the way in which it was done. If wages had been raised slowly and unostentatiously, and after the earnings had become known, the resulting harm would have been far less than under the plan which was adopted. A large amount might have been set aside for old age pensions and various forms of insurance.

As far as the public is concerned, the best feature about this amazing project is that it will set people to thinking. Whether it proves a great success or collapses within a year or two, the experience of the Ford company will be valuable in helping to solve some of the serious sociological problems which confront the country.

Conservation in Education

The announcement that the engineering departments of Harvard University and Massachusetts Institute of Technology are to be combined marks an important step in the prevention of waste and the useless expenditure of large amounts of money. With the completion of the magnificent new plant of the Institute of Technology, in Cambridge, it is made possible to combine the departments of mechanical engineering, electrical engineering, civil and sanitary engineering, mining engineering and metallurgy, so that Harvard will be able to discontinue its teaching of these branches. The two great institutions are to maintain their separate identities and names and the co-operative plan applies to engineering work only. While the Institute of Technology will furnish the buildings and equipment and pay a part of the expense, Harvard will contribute some equipment and the interest on funds which it holds for instruction in engineering. The example thus set by the Massachusetts institutions might well be followed in many other parts of the country, where in even the same city or the same state, work is duplicated. To carry on instruction in engineering in an up-to-date manner necessitates the erection of substantial buildings and the installation of very expensive equipment and it is amazing how petty jealousies, false pride and other obstacles have been allowed to stand in the way of conservation of funds and energy in training men to become engineers.



1—H. H. Brian, Mt. Union Silica Brick Co. 2—J. Howard McFeely, McFeely Fire Brick Co. 3—G. H. Diack, Queens Run Fire Brick Co. 4—J. A. Caldwell, Savage Mountain Fire Brick Co. 5—C. H. Claiborne, Union Mining Co. 6—T. W. D. Addenbrook, Brighton Fire Brick Co. 7—P. J. Sheenan, Niles Fire Brick Co. 8—Wilber Graffins, Hammond Fire Brick Co. 9—Robert A. B. Walsh, Mississippi Glass Co. 10—K. M. Dickey, W. S. Dickey Clay Mfg. Co. 11—Charles S. Reed, Chicago Retort & Fire Brick Co. 12—C. W. Keller, Hays Run Fire Brick Co. 13—T. E. Thomas, Niles Fire Brick Co. 14—J. E. Lewis, Harbison-Walker Refractories Co. (vice president). 15—H. D. Savage, Ashland Fire Brick Co. (president). 16—Cyrus Borgner, Cyrus Borgner Co. 17—G. R. McClintock, Osceola Fire Brick Co. 18—J. J. Brooks Jr., Harbison Walker Refractories Co. 19—E. P. Stevens, Buckeye Fire Brick Co. 20—C. H. Luke, Climax Fire Brick Co. 21—C. R. Dixon, Dover Fire Brick Co. 22—E. W. Dow, American Clay Machine Co. 23—R. H. Youngman, Harbison-Walker Refractories Co. 24—George O. Suppes, Mt. Union Silica Brick Co. 25—Charles W. Parker, Mississippi Glass Co. 26—Porter Kier, Kier Fire Brick Co. 27—George Good, George S. Good Fire Brick Co. 28—Raymond Willey, Harbison-Walker Refractories Co. 29—W. L. Hamilton, Mt. Savage Fire Brick Co. 30—Fred L. Dickey, W. S. Dickey Clay & Mfg. Co. 31—John E. Purtell, Ashland Fire Brick Co. 32—C. O. McNamee, Ashland Fire Brick Co. 33—George E. Prendable, George S. Good Fire Brick Co. 35—A. B. Ewer, Harbison-Walker Refractories Co. 36—W. G. Rose, Sharon Fire Brick Co. 37—O. M. Rief, Harbison-Walker Refractories Co. 38—M. Werry, A. J. Haws & Sons, Ltd. 39—F. H. Gartrell, Ashland Fire Brick Co. 40—M. Morgan, Climax Fire Brick Co. 41—J. H. Smith, McLain Fire Brick Co.

STUDIES METHODS

Refractories Association Seeks Means of Improving Fire Brick.

The photograph of the members of the Refractories Manufacturers' Association, shown on the opposite page, was taken at the society's first annual banquet. Although organized less than a year ago, the association already has taken the lead in the search for improved methods and quality in fire brick manufacture.

Under the society's auspices, many eminent scientists and engineers have delivered addresses on the various clays as well as the most modern methods of manufacturing fire brick. Later the association will conduct elaborate experiments and make a scientific study of clays in order that the best results may be obtained by the manufacturers of refractories. Ovens and methods of firing will be studied.

Importations of Machinery Decrease

Washington, Jan. 13.—Importations of machinery into the United States during November, 1913, with the reduced tariff in effect, were less than they were for the same month of the previous year under the Payne-Aldrich tariff, according to figures submitted to a representative of THE IRON TRADE REVIEW by Secretary of Commerce Redfield. He had no export figures at hand and did not comment on the probability of imports being less because of the natural law of supply and demand, rather than the tariff. There was of course, less activity in the machinery line last November than during the same month in 1912.

The total imports of machinery into this country in November, 1913, Mr. Redfield said, were valued at $430,072, of which $18,832 was free and $411,240 was dutiable. For the same month of the preceding year the imports were valued at $643,440.

Of this total for November, 1913, machinery imports from England were valued at $102,028, of which $691 was free and $101,337 was dutiable. Imports from Scotland were valued at $12,132, of which $1,937 was free and $10,195 was dutiable.

The Crane Valve Co., Bridgeport, Conn., in accordance with its profit-sharing system, observed the end of 1913 by distributing about $100,000 among its employes. The company has about 3,000 employes and the amount received by each amounted to about 5 per cent of annual wages. The advice accompanying the gift was, "Think twice before you spend it".

FLOCKING TO DETROIT

In Hope of Getting Employment at $5 or More Per Day.

Detroit, Mich., Jan. 14.—It is difficult to tell, at this time, just what effect the "$10,000,000 melon-cutting announcement" of the Ford Motor Co. will have on the other manufacturing concerns of Detroit and Detroit's environs. The announcement was only made about 10 days ago and the industrial life of the city has not had time to adjust itself or to realize the situation. Some manufacturers deplore the action, declaring the Ford company has made a most unwise move and a move that is bound to have an unfavorable reaction upon the city; others vow it is a good thing and will be the direct means of attracting the best skilled labor of the country to this city. It is hardly fair or hardly proper at this time to set up as a prophet.

But—a few nights ago the writer was on a train coming from Cincinnati. This was a few days after the Ford company's announcement. On that train were at least 50 men who were on their way to Detroit "in search of positions at the Ford factory." Many were skilled laborers, but all voiced a great desire to get in the factory at "doing anything". The $5-a-day lure had made them willing to forsake the work that they had spent years in perfecting that they might get their names attached to the automobile corporation's payroll. They were willing to sweep floors, being assured that they would be paid $5 a day for doing that, and they hoped that this would lead to better things and bigger pay.

The Ford company has made a number of positive announcements that there is not room for more help at this time. Yet, despite this, workmen are coming into this city by the hundreds and for nearly two weeks the doors of the company have been besieged by men looking for "something to do". It is estimated that more than 10,000 men appeared at the plant several mornings and they lingered for hours in the hope of a favorable word. But the company has not put on any new men. It has contented itself with an announcement that work will probably be given to 4,000 or 4,500 additional men as soon as affairs are straightened out within the factory so as to care for the added labor.

The company is now producing between 800 and 1,000 cars a day in its Detroit plant and 50 cars are being turned out daily from the Walkerville factory. It is understood, of course, that this is not the total output. The factory manufactures many thousands of parts and ships them to the assembling stations in different parts of the country. It is roughly estimated that 15,000 persons are now given employment at the Detroit plant and according to a concern in close touch with the company, it expects to produce 100 cars daily from its Walkerville plant in a few weeks. The various assembling stations are working to the limit and the company's representatives have given out the announcement that this "will be the greatest year in the history of the corporation".

Henry Ford has been in conference with Thomas A. Edison for several days in an effort to devise ways and means for manufacturing an electric vehicle to sell at about $600. This fact, following as it does within a few days of the melon-cutting announcement, serves to draw out the idea that it was most fortunate that Mr. Ford gave up the $10,000,000 to his employes at this time. The $10,000,000 announcement caused the name of Ford and the Ford Motor Co., to be printed on the front page of every newspaper in the United States. It was also carried in the papers of other nations and the chances are it found its way into the prints of nearly every nation on earth. Now, with the Ford electric car under way, it seems little other than reasonable to say that the company has secured far more than $10,000,000 worth of publicity. In fact, $100,000,000 spent in a most judicious way would not bring forth the comment or circulation that was given this story. So—it starts the Ford electric machine off right.

Connecticut's Compensation Law

Considerable difference of opinion has been aroused as to the meaning of certain sections of the new workmen's compensation act, which went into effect in the state of Connecticut on Jan. 1. According to the attorney general's opinion, the law is compulsory, although it was originally adopted as an optional measure. The five commissioners administering the law have advised all employers to recognize the attorney general's opinion until the courts have passed upon the exemption clauses.

In brief, the law requires employ-

ers to compensate workers for occupational injuries, regardless of liability. Non-acceptance of this act takes from either employer or employe his common law defense of contributory negligence by fellow servant or trade hazard. Death which follows an injury brings to beneficiaries compensation for a term of years with $100 for funeral expenses. Injured employes receive hospital and surgical care. Weekly benefits range from $5 to $10. The state itself and cities and towns assume their own risks on the strength of a certificate of solvency. Many large manufacturers have assumed their own risks, but the greater number have accepted the law.

OBITUARIES

William B. Pollock, pioneer manufacturer of the Mahoning valley and for 60 years prominent in the business development of Youngstown, died at the family residence, 507 Elm street, Youngstown, at 9 a. m. Wednesday, Jan. 7, as briefly noted in THE IRON TRADE REVIEW.

Mr. Pollock was born in Pittsburgh, Dec. 7, 1832, moving to Poland, O., at the age of 12, where he attended the academy. He here became a warm friend of the late William McKinley, this attachment continuing until the death of the latter. At the age of 20 years Mr. Pollock went to Youngstown, where he was in the employ of the Brier Hill Coal & Iron Co. for several years. He left this company to found the boiler shop, which has grown to be the large establishment of the William B. Pollock Co. Mr. Pollock had not been actively engaged in business for many years, although he retained the presidency of the company until a year and a half ago, when he was succeeded by his son, Porter Pollock. Mr. Pollock had the distinction of building the first blast furnace for the Jones & Laughlin Steel Co., Pittsburgh.

Caleb Emory Gowen, Cleveland, aged 58 years, died Thursday, Jan. 8, of apoplexy. He was one of the founders of the Kelley Island Lime & Transport Co., of which he was a director to the last, and had been president of the Cleveland Dredge & Dock Co., the Great Lakes Construction Co. He was president and treasurer of the Ottawa Lime & Cement Co., vice president of the Lehigh Portland Cement Co. and a director in the Lakeside & Marblehead Railroad Co., the G. C. Kuhlman Car Co. and the National Commercial Bank.

SLIGHT DECLINE

In Unfilled Tonnage—January Expected to Show Gain.

Shipments of the United States Steel Corporation in December exceeded the new tonnage booked by 114,239 tons, according to the monthly report issued Jan. 10. The unshipped tonnage on Dec. 31, was shown to be 4,282,108 tons, a loss in the month of 114,239 tons. On Dec. 31, 1912, the Steel Corporation's order books stood at 7,932,164 tons, so that the loss in the 12 calendar months of 1913 was 3,650,056 tons, or more than 50 per cent.

The December loss of tonnage was about what had been predicted in these columns. New bookings, thus far in January, according to Corporation officials, have been much in excess of shipments and according to present indications, the month of January will show the first gain in booked tonnage of any month during the past 12.

A statement of the unfilled tonnage of the Steel Corporation showing the changes in tonnage and percentage by months since the plan of announcing monthly the business on hand was adopted, shows the following:

Date.	Total.	Change, tonnage.	Change, per cent.
Dec. 31, 1913....	4,282,108	114,239—	2.59—
Nov. 30, 1913....	4,396,347	117,420—	2.60—
Oct. 31, 1913....	4,513,767	490,018—	9.79—
Sep. 30, 1913....	5,003,785	219,683—	4.24—
Aug. 31, 1913....	5,223,468	175,888—	3.03—
July 31, 1913....	5,399,356	407,965—	7.03—
June 30, 1913....	5,807,317	517,005—	8.18—
May 31, 1913....	6,324,322	654,440—	9.38—
Apr. 30, 1913....	6,978,762	490,194—	6.55—
Mar. 31, 1913....	7,468,956	187,758—	2.45—
Feb. 28, 1913....	7,656,714	170,654—	2.18—
Jan. 31, 1913....	7,827,368	104,796—	1.32—
Dec. 31, 1912....	7,932,164	79,281+	1.01+
Nov. 30, 1912....	7,852,883	258,502+	3.40+
Oct. 31, 1912....	7,594,381	1,042,874+	15.33+
Sep. 30, 1912....	6,551,507	388,132+	6.29+
Aug. 31, 1912....	6,163,375	206,296+	3.46+
July 31, 1912....	5,957,079	149,773+	2.58+
June 30, 1912....	5,807,346	56,363+	0.98+
May 31, 1912....	5,750,983	86,983+	1.52+
Apr. 30, 1912....	5,664,885	360,044+	6.97+
Mar. 31, 1912....	5,304,841	149,359—	2.79—
Feb. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sep. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,900+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400,543	289,624+	9.31+
Jan. 31, 1911....	3,110,919	436,163+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sep. 30, 1910....	3,159,106	379,088—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—

Lawrence Fitch, Milwaukee, has issued a circular to creditors of the bankrupt Beaver Dam Malleable Iron Co. outlining a plan of reorganization. The reorganization plan is for any creditor who desires to do so to pay a proportionate part of the $16,000, according to his claim, and subscribe in like proportion to stock from a new issue of $240,000 worth. A new incorporation is to be made with stock of $400,000.

PERSONALS

A. A. FOWLER, resident partner of Rogers, Brown & Co. at New York City, sailed for Europe Jan. 13 on the Lusitania.

E. B. BLANDY, representative of Pilling & Crane, Philadelphia, in the sale of pig iron in New York territory, has sailed for Nassau, Bahama Islands, for a two-weeks' trip.

EDWARD C. GEEHR, who has been acting purchasing agent for the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, was made permanent purchasing agent Jan. 1.

W. A. ALLEN, formerly with the Carnegie Steel Co., Pittsburgh, now is connected with the R. D. Nuttal Co., that city, as commercial engineer. The Nuttal company manufactures gears.

C. F. BLUE JR., formerly assistant general sales agent of the Crucible Steel Co. of America, Pittsburgh, has been engaged by the Carbon Steel Co., that city, to take charge of the sale of the company's special alloy steel products.

ARTHUR BRAID, metallurgical engineer, of the Goldschmidt Thermit Co., Chicago, will read a paper before the Manufacturers' Association of Chattanooga, on March 4. Mr. Braid's contribution is entitled, "The Alumino-Thermic Process and its Metals and Alloys."

W. B. CHILDERS, who recently returned from Panama, where he was superintendent of erection for the McClintic-Marshall Co., Pittsburgh, at Gatun Locks, spoke before members of the Pittsburgh Foundrymen's Association Jan. 12. He told of his experiences with castings and structural steel.

G. H. BARLENBROCK, formerly engineer with the National Fireproofing Co., Pittsburgh, and recently located in Columbus, O., has been made manager of the reinforcing bar department of the Republic Structural Iron Works Co., Cleveland. Fred S. Fravel, formerly with the Columbus Heating & Ventilating Co., will be assistant to Mr. Barlenbrock.

D. M. PHILBIN retired recently as the operating head of the ore properties of the Great Northern interests. He ceases active business life to enjoy a well-earned rest. Mr. Philbin formerly was general superintendent of the Duluth, South Shore & Atlantic railroad at Marquette. Afterwards he was president of the Duluth & Winnipeg and later general manager of the Eastern Minnesota railroad. The affairs of the Arthur Iron Co., under which name the Great Northern mines are operated, hereafter will be in charge of Carmi Thompson, of St. Paul, general manager, with Earl E. Hunner as general superintendent.

MANAGER LUTHER C. BREWER, superintendent B. W. Valett and Master Mechanic Frank Valett of the Newport Iron Mining Co. have resigned, effective at once. For the time being at least, the positions of manager and superintendent have been merged, with E. L. Cullen in charge. Mr. Brewer had been connected with the company for more than 16 years and for the last five years had occupied the post he has now relinquished. The head offices are at Milwaukee. F. E. Woodbury of that city is the general manager. The company operates the big Newport mine at Ironwood and the Anvil and Palms at Bessemer.

NEW BUSINESS

In New York, machinery sellers are somewhat encouraged by a slight improvement in interest which buyers have manifested since the beginning of the year. There is a better volume of business coming in and inquiries are submitted somewhat more plentifully. All of this business is in small lots, however, and the market is devoid of features of importance. The Pennsylvania railroad has put out inquiries for a few more machines. In general, however, eastern roads continue their policy of staying out of the market as much as possible. One of the large eastern electrical manufacturers reports that it has had more inquiries since Jan. 1 than it received during the two previous months. Export business continues good. Demand for second-hand machinery is fairly active. The Hall Signal Co., Garford, N. J., is beginning to get deliveries on about 40 machines which it purchased last month.

In Pittsburgh, several of the large iron and steel manufacturers have completed lists showing equipment requirements for this year and buying will be on a very satisfactory scale if appropriations are allowed. Machine tool dealers say improved sentiment has led them to believe greater activity will prevail shortly. Inquiries for heavy rolling mill machinery are coming out in fairly good volume.

In Chicago, there has been moderate improvement in the machinery trade since Jan. 1. Dealers, however, feel that business is still some distance from normal conditions. A few railroads are inquiring for miscellaneous tools and tool steel, including the Lake Shore and Burlington. Business in electrical machinery seems better than the machine tool trade.

In Cincinnati, there is more of an optimistic feeling among machinery manufacturers than at any time during the last half of 1913, principally because of the prospects of a large amount of business being closed that has been pending for a long time. Several railroads have large lists out for machine tools, and they have given the metal trade the impression that a large proportion of these will be contracted for before spring. As far as actual sales are concerned, the present month has been no better than either November or December of last year. Very few machine shops are running over 65 per cent of their total capacities, and there is a surplus of help including both skilled and common labor. Jobbing foundries are not very busy and some are barely operating.

NORTHEASTERN STATES

AUGUSTA, ME.—The Arrow Cycle Car Co. has been incorporated; automobiles, motor vehicles, cycle cars, trucks, etc.; $50,000; by R. S. Buzzell, president; L. J. Coleman, treasurer, Augusta.

SKOWHEGAN, ME.—The Skowhegan Electric Co. has been incorporated; $200,000; by H. L. Sweet, president, Skowhegan, et al.

BURLINGTON, VT.—Grace Machine Co. has been incorporated to work at the business of machinists, tool makers, metal workers and smithing and to buy and sell tools, machines, forgings, etc.; $5,000; by Bernard B. Whalen, Cornelius A. Whalen, John W. Grace.

BOSTON.—Boston Structural Steel Co. has been incorporated; $15,000; by William P. Shine, Paul Hunt and Elinor Gleneskie.

BOSTON.—The Claremont Machinery Co. has been incorporated; machinery; $4,000,000; by James C. Carroll, John B. Pierce, John M. Foster.

NORTH BRATTLEBORO, MASS.—Within the next three months the Electric Light and Water department plans to build a fireproof storage warehouse (concrete and steel construction) to replace the one destroyed by fire; also construct a fireproof boiler room and install a new 150-horsepower boiler.

SOUTH BOSTON, MASS.—New England Iron Works Co. is erecting a boiler shop, to cost $30,000; Herbert A. Wilson and E. C. Sherman, Boston, architects.

SPRINGFIELD, MASS.—Bids will be received until Jan. 29 by John A. Denison, mayor, for steel work for two underpasses.

ANSONIA, CONN.—The American Brass Co. is building an extensive addition to the plant of the Ansonia Brass & Copper Branch, in Ansonia. The addition will be two stories, 60 x 440 feet.

BRIDGEPORT, CONN.—Warner Bros. Co., manufacturer of metal stamping machinery, will shortly build a brick and steel, six-story addition to its plant at the corner of Lafayette and Atlantic streets.

HARTFORD, CONN.—A 44 x 46-foot addition is being built at the foundry of J. W. Conway.

HARTFORD, CONN.—The Toolometer Co. has been incorporated measuring instruments; $100,000; by Clark L. Brander, president and treasurer.

HARTFORD, CONN.—The Underwood Typewriter Co. has purchased a large tract adjoining its present plant and plans to build four additional buildings. Work on the first will be commenced in spring.

NEW HAVEN, CONN.—The Index Visable Co. is building a two-story, brick, 35 x 90-foot factory building.

NEW LONDON, CONN.—The Connecticut Power Co. will soon commence the erection of two new gas purifiers on the site occupied by Spier Brothers' boiler factory.

STRATFORD, CONN.—The Stratford Engineering Co. is erecting a new plant, the main building to be three stories, of brick, 60 x 150 feet.

TORRINGTON, CONN.—The Torrington Electric Light Co. has let the contract for a new sub-station and power plant.

WINDSOR LOCKS, CONN.—E. Horton & Sons Co. is remodeling its foundry into a storage building.

ALBANY.—The Ogdensburg Machine Co. has been incorporated; $10,000; directors the first year, John Hannan, Herbert H. Saunders, Edward P. Carmody, Ogdensburg.

ALBANY.—Electrical Safety Devices Mfg. Co. has been incorporated; $20,000; by Horace E. Nichols, Schenectady; William Addison, and Smith O'Brien, Albany.

BROOKLYN.—Hacker Safety Hydro-Aeroplane Co. has been incorporated to manufacture flying machines; $75,000; by David Hacker, Paul Saussman, Harry Lapin, 170 East Ninety-sixth street.

BUFFALO.—The Queen City Foundry Co. is to erect a foundry 100 x 200 feet. J. G. Gauthier, general manager, 445 Crescent street.

BUFFALO.—The Boltless Arch Bar Truck Co. has been incorporated; $50,000; by R. S. Kent, F. C. Lee, Phillip Catelano.

HORNELL, N. Y.—Plans are being made by the Hornell Electric Co., Luther F. Mason, general manager, for a power house, 50 x 60 feet.

LONG ISLAND CITY.—An eight-story factory and warehouse is to be erected for the American Ever Ready Co., to cost about $200,000. Plans by Maynicke & French, New York City.

LYONS, N. Y.—This town voted Dec. 30 to issue $142,000 bonds for a pure water system; water to be brought from Junius Lakes.

NEW YORK CITY.—Moore International Silencer Corp. has been incorporated; rifles, guns; $100,000; by R. A. Moore, C. P. Breckenridge, W. L. Tucker, 135 Broadway. Moore National Silencer Corp., $100,000; same.

NEW YORK CITY.—The Stransky Manufacturing Co. has been incorporated; aluminum, nickle, tin articles; $10,000; William H. Weil is a director.

NEW YORK CITY.—E. B. Vanatta & Co. have been incorporated; manufacture machinery; $20,000; by J. E. Garbrant, M. B. Cohn, E. Van Atta, 30 Church street, New York City.

NEW YORK CITY.—Steel Utilities has been incorporated to manufacture machinery and appliances; $100,000; by P. H. B. Frelinghuysen, T. P. Payne, J. A. Edwards, 32 Liberty street.

SODUS, N. Y.—B. J. Case, J. G. Case and others of Sodus are preparing to build a concrete and steel storage plant, 60,000 barrel capacity, to cost $100,000.

SYRACUSE, N. Y.—Wiegard, McGrath & Powers have been awarded the contract for a case hardening building of structural steel, brick and concrete for the New Process Gear Co.

CHARLEROI, PA.—The Charleroi Foundry & Machine Co. is building an extension to its plant and is installing a runway for a 10-ton crane, which will serve the main building.

GERMANTOWN, PA.—Wirt Electric Specialty Co. has plans from John Molitor, architect, for factory building.

HAMBURG, PA.—Hamburg Boiler Works wants a second-hand hand-power crane for outside service; with or without runways; not less than ten tons capacity, with span 43 to 60 feet. Henry Seiders, proprietor, Hamburg.

LATROBE, PA.—The Latrobe Tool Co. has practically completed its new plant at this point, and has started the manufacture of a line of high speed steel tools. The main building is 100 x 60 feet. The company was recently organized by Pittsburgh interests.

PITTSBURGH.—The Broad Mfg. Co. has opened a shop on Carson street, South Side, for the manufacture of a line of hand operated rotary tools.

PITTSBURGH.—The Jackson Engineering Co., Pittsburgh, will install a system of Peerless third rail insulators for crane runways in the plant of the American Sheet & Tin Plate Co. at New Castle, Pa.

PITTSBURGH.—The George J. Hagan Co., People's Bank building, has received a contract for a stoker-fired double annealing fur-

nace for installation in the sheet mills of the Whitaker-Glessner Co., Wheeling, W. Va.

SHARON, PA.—A steel bridge is to be built next summer to replace the present structure at State street, which has been condemned. Plans are being drawn for the structure at present.

UNIONTOWN, PA.—The Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co., Youngstown, O., has been incorporated by E. H. Reppert, S. J. Morrow and T. E. Chamberlain, all of this city. The company will develop coal land in Green county.

CAMDEN, N. J.—Acme Staple Co. has been incorporated; wire staples, driving machines, etc.; $100,000; by J. G. Mackey, A. Flowers, J. H. Bernheiser, Camden.

WILMINGTON, DEL.—Briscoe Motor Co. has been incorporated; automobiles, motor trucks, etc.; $500,000; by L. E. Latta, New York City; W. J. Maloney, H. E. Latta, Wilmington.

WASHINGTON.—Bids will be received until 10:30 a. m., Jan. 20, at the office of the general purchasing officer of the Isthmian Canal Commission for furnishing by steamer free of all charges, on dock at either Colon (Atlantic port) or port of Ancon (Balboa, Canal Zone) (Pacific port), Isthmus of Panama, the following: Steel cable, chain, nails, boat spikes, valves, cocks, brass pipe and fittings, wrought iron and steel pipe and fittings, lead pipe and fittings, pipe escutcheons and hangers, solder litharge.

CENTRAL STATES

CAMBRIDGE, O.—The plant of the American Sheet & Tin Plate Co. is to be reconstructed of steel in several departments, at a cost of about $70,000.

CANAL DOVER, O. — Chicago Steel & Bridge Works has been given contract for standpipe and reservoir at $21,525; Massillon Iron & Steel Co. will furnish pipe for mains.

CANTON, O.—Plans are being drawn for two mills to be built next spring by the United Steel Co. They will be an 8-inch and a 9-inch bar mill. One will be 80 x 320 feet and the other 65 x 120 feet, of steel and concrete, equipped with traveling cranes and latest type of machinery. Harry R. Jones is treasurer and general manager.

CINCINNATI.—The Neil & Smith Electric Tool Co. has been incorporated; $30,000; by John W. Neil, Edward F. Smith and R. K. Lebond.

CINCINNATI.—A small amount of light machinery such as is used in the repair of automobiles will be needed by the Mutual Garage Co., Cincinnati, which will soon erect a garage on Montgomery pike, Norwood, a suburb. The building will be 55 x 100 feet and one story in height.

CINCINNATI.—The Victor Auto Parts Co., Cincinnati, will erect a new factory building at Spring Grove and Durham avenues, that city, that will cost about $40,000. The building will be 200 feet square, two stories in height, and will contain about 50,000 feet of floor space. The company is now located at Second and Elm streets, Cincinnati, and manufactures motor lamps and a special tool box. John L. Corcoran is president and Zettle & Rapp, architects, Cincinnati, are in charge of the building.

CLEVELAND.—Stone-Steele Machinery Co. has been incorporated to manufacture and deal in machinery of all kinds; $1,500; by Louis E. Steele, Priscilla Steele, Tillie S. Stone, Chas. A. Stone and Max F. Goodman.

COLUMBUS, O.—The Mt. Vernon Bridge Co. has the contract for the Darby Creek bridge superstructure near here.

DAYTON, O.—The Air-Friction Carburetor Co. is making plans to build a plant for its own use this fall.

DAYTON, O.—Dayton Tool & Die Co. has been incorporated; $10,000; by F. P. Chamberlain, E. Mitchell, V. A. Troxwell, M. Williamson, W. Schubert.

DAYTON, O.—The Meter Valve Carburetor Co. has been incorporated; $20,000; by George W. John, Horace R. Marquis, John C. Collett, Hatden A. Kern and Seymour B. Kelley.

MASSILLON, O. — American Stamping & Enameling Co. will build a branch plant here in the spring, 20 x 350 feet, instead of removing the plant from Bellaire, O. R. E. Bebb, Canton, is a director.

MINERAL CITY, O.—Federal Clay Product Co. is to install a 1,000-horsepower electric power plant and is asking prices on equipment. Water tube boilers with superheaters are favored. Three engines of 450 horsepower, 300 horsepower and 150 horsepower are under consideration and some motors will be required.

NILES, O.—The DeForest Sheet & Tin Plate Co. has increased capital from $400,000 to $600,000.

OLMSTEAD, O.—The Olmstead Metal Products Co. has been incorporated; $30,000; by R. E. Humphrey, W. C. McCullogh, William H. Millikan, F. S. Taylor and I. B. Buehrig.

PORTSMOUTH, O.—Bids will be received until Jan. 22 at the office of Thos. C. Patterson, county auditor, for furnishing material and constructing five main piers sunk to bed rock; also constructing steel superstructure of four 360-foot and three 49-foot spans.

SANDUSKY, O.—Bay View Foundry expects to build a plant in the west end in the spring. Plans are completed.

SANDUSKY, O.—The inventory and appraisment of the property of the Sandusky Auto Parts & Motor Truck Co. is completed, showing a total appraisment exclusive of accounts of $125,000. The trustee will ask for the immediate sale of the company's plant.

SPRINGFIELD, O.—The National Mortising Machine Co. has been incorporated; mortising machines; $10,000; by George W. Campbell, Charles H. Lannert, J. J .Hartman, Alden E. Overholzer, James P. Goodwin.

TOLEDO.—The Refrigerating Machine Co. has been incorporated; machines and all appliances; $25,000; by George Runkel, E. L. Rowe, H. C. Adams, E. R. Kirkendall, W. H. Haynes.

TROY.—The C. H. & D. railroad is to build a steel girder bridge here over Stillwater river, to replace a pile structure.

HENDRICKS, W. VA.—Dorcas & Ryan contemplate erection of plant to manufacture combination gas and coal stoves; L. B. Dorcas, secretary, Box No. 3.

WHEELING, W. VA.—Wheeling Metal & Mfg. Co. is to build an addition to its plant at Glendale to be used for production of tin and galvanized iron shingles.

LOUISVILLE, KY.—Bids will be received by Major J. C. Oakes, Corps Engineers, U. S. A., until Jan. 31, for fabrication and delivery of metal work for emergency dam at Lock 41, Ohio river.

ANDERSON, IND.—The Peacemaker Sewing Machine Co. is building a small plant for producing its output of machines. Henry Neuman is inventor of the device.

INDIANAPOLIS.—Vonnegut Machinery Co. has been incorporated; machinery and factory supplies; directors, Anton and Clemens Vonnegut and Louis Hollweg.

INDIANAPOLIS.—Central Boiler & Sheet Iron Works has been incorporated to manufacture and sell boilers, tanks, etc.; $10,000; by F. J. Schneider, M. P. Herter, M. N. Schneider.

INDIANAPOLIS. — E. Darrow, general manager of the Merchants Heat & Light Co., expects to buy within the next four months a 10,000-kilovolt-ampere turbo-generator set. An addition to the No. 2 plant is to be erected.

RICHMOND, IND.—The Robinson Foundry Co. is planning to enlarge the foundry plant. H. R. Robinson is a member of the company.

CHICAGO.—Leopold Cohen Iron Co. has been incorporated; $10,000; by John D. Clancy, George B. Cohen, Leopold Cohen.

CHICAGO.—The Steel Stamping Co. has been incorporated; steel and iron; $15,000; by E. A. Zimmerman, Abram L. Myers, Mabel K. Busse.

CHICAGO.—Brocton Die Co., of Illinois, has been incorporated; dies, tools and machinery; $2,500; John Keijar, John Larson, William Anderson.

CHICAGO.—Automobile Fender Equipment Co. has been incorporated; $25,000; by Clarence M. Baldwin, Francis M. Suttle, Frank H. Towner.

CHICAGO.—Holmes Pvott & Co. have been incorporated to conduct a general iron foundry, structural iron works, etc.; $200,000; by Oliver W. Holmes, David A. Pyott, Walter E. Pond.

CHICAGO.—The Orton & Steinbrenner Co., Chicago, is making an extension to its plant which will increase the output about one-third. The new construction includes a building 100 feet square with an electric traveling crane. The building is now under cover and will be ready for operation about Jan. 15. Practically all of the tools for this extension have been purchased. The company, in addition to the manufacture of locomotive cranes, drag line excavators, elevating and conveying machinery and coal crushers, is now manufacturing orange peel buckets ranging from ½ to 1½ cubic yards capacity. These buckets are made throughout of steel with the exception of bronze bushings and a heavy cast iron power wheel.

MAYWOOD, ILL.—Bids will be received until Jan. 22 for one motor-driven air compressor, three motor-driven centrifugal pumps, three-panel switchboard with transformers, switches, measuring and recording apparatus and wiring. W. H. Rosecrans Eng. Co., 30 N. La Salle street, Chicago, engineers. Address village clerk.

GRAND RAPIDS, MICH. — The Utilities Engineering Co. has been incorporated to design, plan and superintend the construction of engineering enterprises, especially of a public utility nature; $25,000; by E. M. Dean, A. I. Snyder, B. P. Merrick. Offices in Michigan Trust building.

JACKSON, MICH. — Briscoe Motor Car Co., New York City, is to erect an assembling plant here and will use capacity of Lewis Spring & Axle Co. in manufacture of parts.

SPARTA, MICH.—Sparta Foundry Co. has been incorporated to operate a foundry; $5,000; by G. E. Rose and W. J. Van Gorden.

APPLETON, WIS.—The Riverside Fibre & Paper Co., of Appleton, is having plans prepared for the construction of a large paper mill in conjunction with its fibre mill at Third Lock, on Fox river north of Appleton. The present paper mill some miles distant is to be abandoned and the equipment will form part of the equipment of the new mill. Stephen H. Murphy, Appleton, is secretary.

BELOIT, WIS.—Robert R. Caldwell, city engineer, has been directed to make surveys and prepare estimates for the construction of a steel or concrete highway bridge over Rock river at Public avenue. The improvement is estimated to cost in the neighborhood of $50,000.

FOND DU LAC, WIS.—A third story will be added to the main works of the Northern Casket Co., and will be equipped with glue-joining machinery and other woodworking tools. The power plant will be increased in size to accommodate the increased demand.

GREEN BAY, WIS.—The common council has directed that surveys and estimates be prepared for a new steel draw or bascule bridge over Fox river at Mason street, to replace the steel bridge which collapsed recently and has since been patched up for temporary use. It is planned to build the new bridge by the end of 1914. The cost will be about $165,000.

HARTLAND, WIS.—The Hartland Mfg. Co. has been organized here with $20,000 capital stock to manufacture farm implements. The owners are T. A. Bakken, W. B. H. Kerr and John H. Krause.

HUDSON, WIS.—C. M. and J. M. Arnquist, of Hudson, have applied to the state railway commission for authority to construct a 400-foot dam and construct and operate a hydro-electric power plant for commercial purposes on Apple river, near Star Prairie, St. Croix county. The plant is to serve Hudson, New Richmond and other neighboring cities. It is expected that the permit, the first to be sought under the new Wisconsin water power law, will be granted.

KENOSHA, WIS.—The Wisconsin Gas & Electric Co., a North American property operating public utilities in Racine and Kenosha, is planning to rehabilitate the old Kenosha gas plant, which has been out of commission for several years. The plans contemplate the re-equipment of the plant and the installation of a large holder.

MADISON, WIS.—Otto J. Biederstadt of Madison, is preparing to build a store and office building, six stories, of brick, concrete and steel, to cost $75,000.

MILWAUKEE.—Rutz Gas Specialty Co. has been incorporated to manufacture and sell gas specialties; $10,000; by Arnold O. Rutz, Julius F. Rutz, Charles B. Nehring.

MILWAUKEE.—Wisconsin Welding & Cutting Co. has been incorporated to operate general machine and repair shop; $1,000; by Samuel H. Smith, Wm. Weisner, L. J. Weil. E. G. Wurster, attorney.

MILWAUKEE.—Quam Pneumatic Cleaner Co. has been incorporated to deal in vacuum cleaners and other electrical appliances; $25,000; by Jas. P. Quam, Victor Hamm, H. J. Trost, attorney.

MILWAUKEE.—An increase of $750,000 has been made in the capital stock of the Plankinton Packing Co., Muskego avenue and Canal street. The company has just broken ground for a new packing and refrigerating plant to cost $350,000.

MILWAUKEE.—The A. Gettelman Brewing Co., Forty-second and State streets, has increased its capital stock from $80,000 to $560,000. Part of the new issue will be devoted to extensions of the brewing and power plant, plans for which are now being outlined. Adam Gettelman is president.

MILWAUKEE.—The Wisconsin Telephone Co. appropriated $300,000 for improvements and new equipment in the Milwaukee, Beloit, Madison and Eau Claire exchange districts, at the annual meeting here. In Milwaukee a new main exchange building will be erected and other improvements made to cost about one-half of the total appropriation. George C. French, 185 Fifth street, Milwaukee, is manager.

MILWAUKEE.—The Raulf Co., Patton building, was awarded the contract for building the new malleable iron foundry plant at Midland, Ont., for the newly-organized Midland Malleable Iron Co., promoted by E. J. Vanderboom, formerly of Milwaukee. The in-